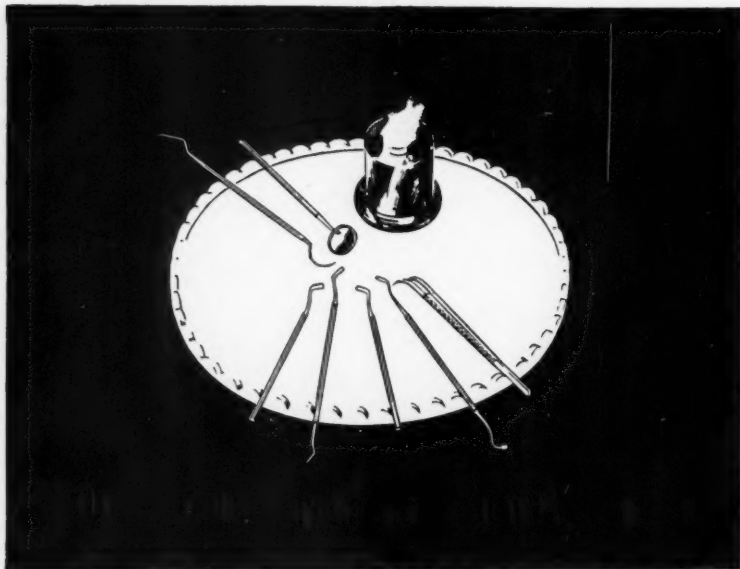


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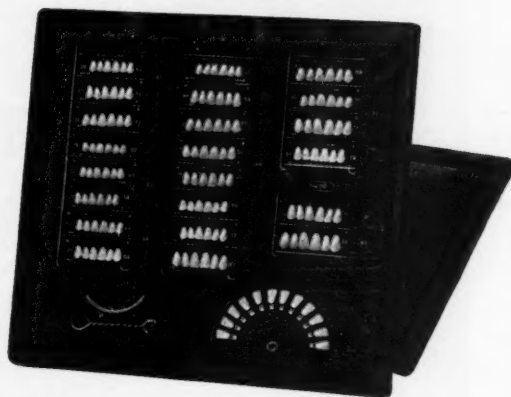
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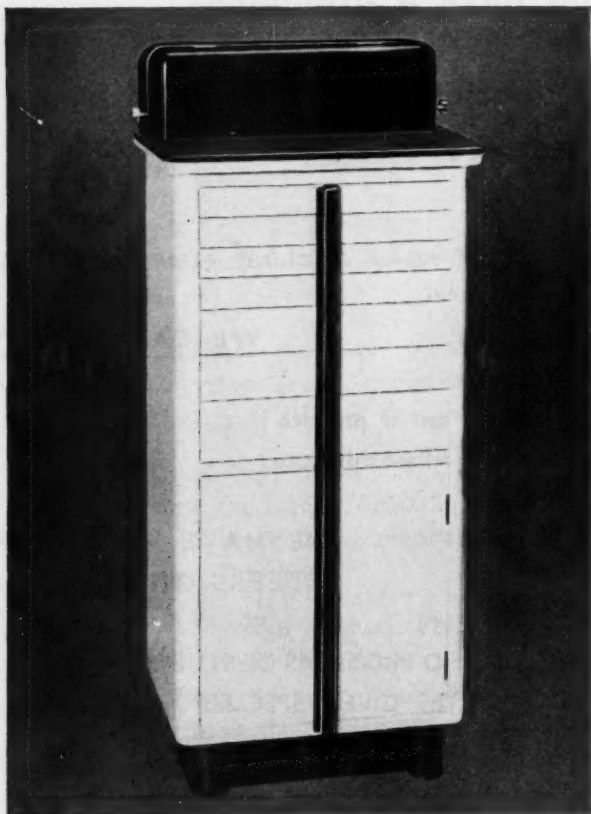
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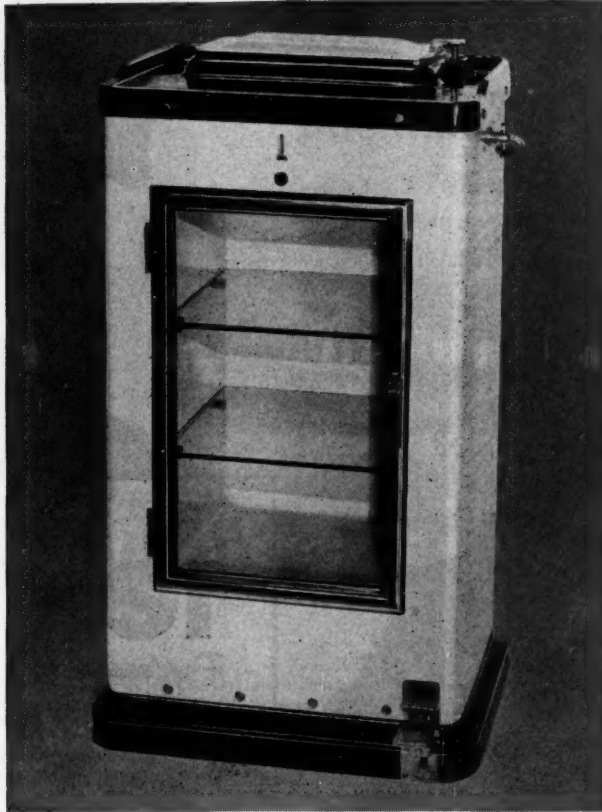
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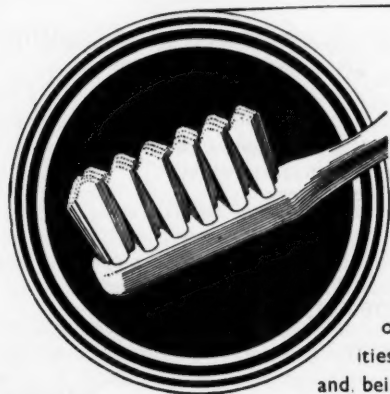
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THE STRENGTH OF ACRYLIC REPAIRS

Albert L. Ware, B.Sc. (Melb.)* and Alan R. Docking, M.Sc. (Melb.) A.A.C.I.*

An improved technique for the repair of acrylic dentures based on laboratory tests on transverse strength specimens is described. New features include the elimination of all sharp angles in the repair joints and a method for ensuring positive pressure on the repair material while curing. Practical recommendations are also made in regard to wax elimination, the use of acrylic cement, the condition of the acrylic mixture for packing, and a suitable curing treatment.

In view of its importance, it would be expected that a detailed procedure for the repair of acrylic dentures would be provided in any modern treatise on dental prosthesis. This, however, is not generally the case for the significance of important factors is frequently neglected. In available text-books, where special mention is made concerning it, the subject is treated in several different ways.

Firstly, some writers have given a full outline of the repair of vulcanite dentures and then without experimental confirmation indicated that this procedure with some modification as, for instance, the elimination of dovetails and other mechanical interlocks, was suitable for acrylic resins.

Others again, after describing in full the making of a complete acrylic denture have assumed, perhaps with some reservations, that this should likewise apply to a repair in the same material.

On the other hand, Vernon-Benshoff Co. from the inception of its trade periodical *Vernonite Work Bench* in 1942 has consistently directed attention to various factors peculiar to denture repairs with acrylic resins. These include the curing treatment at 160-165°F. to prevent warping, the use of monomer on the joint ends for wax removal and better adhesion, the cooling rate of the flask, and other factors.

*Commonwealth Bureau of Dental Standards, Melbourne University.

In 1943 a comprehensive and well-illustrated procedure for acrylic repairs was presented¹, but, apart from Tylman and Peyton² who have reproduced the information, this systematic approach to the problem has not received the attention it deserves.

Various workers have attempted, with the aid of experimental data, to assess the effectiveness of some of the factors involved. Their work will be discussed in more detail throughout this paper.

Having noted the claims of Vernon-Benshoff Co.³ that acrylic repairs could be effected with a strength equal to or greater than that of the original, the data presented by Osborne⁴ showing high transverse strengths, and various references to the apparent ease of effecting a satisfactory repair with methyl methacrylate resin, it would appear that such repairs should present no difficulty.

In this Laboratory, however, at the commencement of this investigation the indications were that for the available brands cured after the various methods recommended and with meticulous care in preparation, the best that could be achieved for the transverse strength of repairs was from $\frac{1}{2}$ to $\frac{3}{4}$ the strength of the original. This conclusion was the result of over 100 preliminary tests on specimens prepared in the laboratory or by practising dentists whose assistance had been sought.

In view of these results, each step in the repair procedure was examined as a possible cause of failure.

The relevant factors involved were considered to be:—

1. The preparation of the ends to be joined.
2. The removal of the wax.
3. The formation of a satisfactory bond between the original material and the repair material.
4. The optimum stage for packing the acrylic powder-liquid mixture.
5. The provision of a positive pressure on the repair throughout the curing treatment.
6. A suitable curing treatment.
7. The method of cooling the flask.

To evaluate these factors transverse strength tests were carried out on prepared specimens as outlined below.

¹ Vernon-Benshoff Co.—Repair of Acrylic Resin Dentures. Vernomite Work Bench, 2(12):2-4, 1943.

² Tylman, S. D. and Peyton, F. A.—Acrylics and other Dental Resins. Philadelphia, J. B. Lippincott Co., 1946, pp. 377-86.

³ Vernon-Benshoff Co.—Strength of Repairs. Vernomite Work Bench, 6(10):3-4, 1947.

⁴ Osborne, J.—Transverse Tests on Denture Base Materials. B.D.J., 86:64-7, 1949.

TEST PROCEDURE:

The materials used in this investigation were acrylic resins normally supplied for dentures, comprising Co-pol, Kallodent, Methadent, Stellon, and Supearl. In the tables to follow these are designated by code letters, not in the order listed as it is not intended in this paper to compare the relative merits of the available resins.

The test specimens were prepared and tested for transverse properties in the manner described in the American Dental Association Specification No. 12 for Denture Base Material, Acrylic Resin, etc.⁵ Briefly, the specified transverse test consists of placing a wet specimen of cured resin 65 x 10 x 2.5 mm. over a 50 mm. span and subjecting it to a central load, the temperature being maintained at 37°C. The load is increased in a regular manner until the specimen breaks, deflections of the centre of the span being read at intervals by means of an indicator.

In this investigation, blocks of acrylic resin 65 x 50 x 3.0 mm. were prepared using a curing treatment of 1½ hours in water at 65°C., ½ hour to the boiling point, then boiling for ½ hour. These blocks were cut into four strips and machined to a size approximately 0.10 to 0.15 mm. wider and thicker than required for the specified transverse specimens. These specimens were cut or broken and the ends to be joined were prepared. The specimens were waxed up, invested and repaired according to the conditions decided upon for the various tests. When the specimen to be repaired was made with pink acrylic resin, clear repair material was used, and vice versa. In this way the position of failure could be more easily observed. After the completion of the repair, the specimens were machined just oversize and finished to size on 400 mesh Hydrodurexil paper.

The specimens were placed in the transverse testing apparatus always loaded with the wider section of the repair upward. This is a relatively severe test but the application of the stress is more closely related to that encountered in practice than with tensile or compression tests.

RESULTS AND DISCUSSION:

The importance of the factors listed as relevant to the strength of a repair will now be considered in detail together with the test data obtained. The transverse strength results only are considered as the flexibilities (deflections at a given load) of the specimens before and after repair were not significantly different.

It should be understood that original and repair strengths quoted in the tables are independent as they do not apply to the same specimen; however, each series represents tests carried out at the same time and under the same conditions.

⁵ American Dental Association Research Commission—Revised A.D.A. Specification No. 12, for Denture Base Material Acrylic Resin or Mixture of Acrylic and other Resins. J.A.D.A., 29:127-30, 1942.

1. *Preparation of a Suitable Joint*: It has been recommended by Osborne^{6, 7} and Tylman and Peyton² that the broken ends must be prepared by roughening

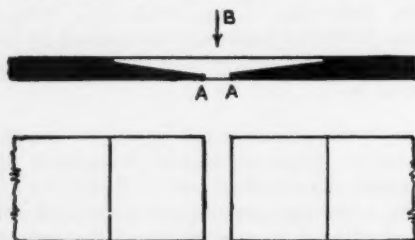


Fig. 1.—Repair specimen showing conventional form of joint with sharp edges and corners.

the old material and forming a joint with sharp angles as indicated in "figure 1" but it was found that when the specimen was loaded at position B during the transverse test, the majority of fractures started at the position marked A at the boundary between the old and new material.

When the new material is being cured between the fixed ends of the old material it is evident that the shrinkage due to polymerization of the new material will give rise to stress concentrations along the boundary. To distribute this stress it is necessary to eliminate all sharp corners and angles where excessive stresses might arise. Even when curing the acrylic resin in boiling water it does not soften sufficiently to round off these sharp edges, as can be observed by virtue of the clear material. In order to minimise these stress concentrations, the form of joint shown in "figure 2" was adopted. Sharp edges were eliminated by finishing with a cotton buff and pumice. Observations of the joint in clear



Fig. 2.—Repair specimen showing recommended form of joint.

acrylic between polarizing screen showed stress concentrations around the sharp-edged joints only. It is of interest to note that the maximum stress concentration in the smooth joint was always observed at the end of the flash on the specimen. No systematic check was made for comparative stress concentrations by the polarized light method⁸ between sharp and smooth joints under load, but work on this aspect is in hand.

⁶ Osborne, J.—*Acrylic Resins in Dentistry*, 3rd Ed., Oxford, Blackwell Scientific Publications Ltd., 1948, pp. 86-89.

⁷ Osborne, J.—*Dental Mechanics for Students*, 2nd Ed., London, Staples Press, 1948, pp. 289-90.

⁸ Horton, E.—*An Experimental Investigation of Internal Strains in Polymerised Methyl Methacrylate as Revealed by Polarised Light*. B.D.J., 86:133-42, 176-80, 1949.

Comparison of the effectiveness of the joints is shown in Table 1. It is evident from these results that the transverse strength of the smooth joints is far superior to that of the joints with sharp edges and corners. It is apparent, therefore, that the type of joint usually recommended in practice will produce repairs of inferior strength.

TABLE 1.

Mechanical Preparation of Joint.

(Figures represent transverse breaking load in gm. Those quoted for the original material have been obtained at the same time and under the same conditions as the repair.)

"Sharp" Joint, Fig. 1		Smooth Joint, Fig. 2		Material
Original	Repair	Repair	Original	
5,800	3,400	5,300	6,000	A
6,500	4,500	6,050	6,000	
	5,500	6,500		
8,050	4,500	5,550	7,000	B
8,500	4,600	6,000	7,050	
8,500	5,450			
7,100	1,800	5,500	7,100	B
7,300	2,400	6,000	7,300	
		7,000		
6,100	2,750	6,000	6,000	C
6,800	3,000	6,000	6,500	
7,000	3,500	7,000	6,900	
7,500	3,500			
7,700	4,000			
7,750	5,000			
7,400	4,000	6,500	6,600	C
8,200	6,400	6,800	7,400	
5,600	4,000	6,000	7,000	D
		6,400	7,200	
			7,400	

2. *Elimination of the Wax:* Tuckfield, Worner and Guerin⁹, Vernon-Benshoff Co.^{1, 10}, Osborne¹¹, and others, consider that it is undesirable to subject a denture to temperatures approaching that of boiling water owing to the probability of warping. Thus wax elimination presents a difficulty.

Solvents are out of the question because they are almost certain to cause crazing and possibly failure of the denture as a consequence.

⁹ Tuckfield, W. J., Worner, H. K., and Guerin, B. D.—Acrylic Resins in Dentistry. Part II. Aust.J.Dent., 47:1-26, 1943.

¹⁰ Vernon-Benshoff Co.—Repair at Low Temperature. Vernonite Work Bench, 2(3):1, 1943.

¹¹ Osborne, J.—Internal Strains in Acrylic Denture Base Materials. B.D.J., 82:204-12, 1947.

Although methods which would cause the whole of the wax to melt are described, this is undesirable as wax would spread over the denture and investment.

To remove the bulk of the wax the closed flask is immersed in boiling water for 2 to 3 minutes and then stood on the bench for 3 minutes. The wax is then soft enough to be lifted out. Any remaining wax is eliminated by pouring a stream of boiling water along the repair section. Alternatively, after the softened wax has been removed the open flask may be placed in a controlled temperature bath held at a temperature of 70°C. for, say, $\frac{1}{2}$ hour.

Base-plate waxes have a range of melting from 50° to 65°C., and hence it will be found in some cases that the latter method is unsatisfactory. A sticky residue is also left by some waxes which in spite of the use of boiling water may cause failure. To make certain of freedom from wax residue, a swab of cotton wool moistened with monomer but without any free-flowing liquid may be used to wipe over the ends of the joint.¹² A wash with a weak solution of sodium carbonate may also be used, but is not generally recommended because it tends to roughen the plaster.¹³

Elimination of the wax is more difficult with the type of joint shown in Fig. 2, but this can be achieved provided sufficient care is taken and the undercuts are not too extensive. Further work is progressing with the use of surface-active agents to reduce the time required for effective wax elimination.

The results shown in Table 2 indicate that the methods adopted in removing the wax, although a little more troublesome, were effective.

TABLE 2
Wax Elimination.

Method of final elimination	Transverse Strength, gm.	Material
No wax used	5,800 6,000	A
Boiling water	5,500 7,500	B
Water at 70°C.	6,000 7,000	B

3. *Bond between Original and Repair Material*: Earlier tests indicated that the surface of the hard original material would have to be softened to form a bond with the plastic repair material, for even with a clean joint adhesion was lacking when no such provision was made. Softening may be achieved in two ways, either by the painting of the ends of the joint with acrylic monomer or by packing the acrylic repair mixture at an earlier stage than normal. The latter alternative is discussed under the next heading.

Painting the ends of the joint with acrylic monomer was found satisfactory if applied with care but crazing often occurred with resultant breakdown when excess liquid ran into highly stressed areas. Again, owing to the volatility of pure monomer much of it evaporated instead of softening the old material.

¹² Vernon-Benshoff Co.—Repairs that Break. Vernomite Work Bench, 2(2):1, 1943.

¹³ Tuckfield, W. J.—Full Denture Technique, 2nd Ed., Melbourne. The Australian College of Dentistry, 1945, p. 217.

A solution giving greater latitude may be prepared by allowing to stand for an hour or two a mixture of about four volumes of monomer with one of acrylic powder to form an acrylic cement of the consistency of honey. This liquid is far easier to control and so can be limited more readily to the prepared ends. However, care must be exercised in its use as too much will also cause crazing. One thin coating about 5 minutes before packing gives satisfactory results.

From many preliminary results it was concluded that, when the acrylic repair mixture is packed at the normal stage, painting with monomer is essential in order to obtain consistently good adhesion. Where the modified method of packing to be described next is used, painting with acrylic cement appears, from the results shown in Table 3, not to be so essential, but is advisable as a precaution against possible failure through a weak bond.

TABLE 3
Treatment of the Ends of Joint
(Figures represent transverse breaking load in gm.).

Original Material	No Monomer	Monomer	Acrylic Cement	Material
5,900 6,100 6,500	3,100 5,450		4,500 7,000	E
6,500 6,500 6,600		5,500 6,500	6,500 6,600	A
6,600 7,100 7,300	6,100 6,500 6,800 7,000		6,500 6,800 7,000 7,500	B

4. *Optimum Time for Packing:* In addition to the use of a softening agent as outlined in the previous section, it is reasonable to expect that if the acrylic mixture is packed into the repair when it is first mixed the old material will be softened by the monomer at the same time as the powder particles are undergoing dissolution. This may be theoretically sound, but in practice the excess monomer will often ruin the specimen through crazing.

However, it was found that the best results were obtained if packing was carried out at the early dough stage while still sticky just before the usual denture packing stage is reached. At this stage the acrylic mixture is a little more difficult to handle but the extra strength is worth the trouble. On the other hand, as already indicated, if the acrylic mixture is packed too early, excess monomer is squeezed out and the repair will craze along the monomer "tide-line." The very fast setting resins are not suitable for this procedure.

The results of a short series of tests are included in Table 4. The set of figures for material A is not comparable with the other reported results as the procedure discussed in the next section was not then being used, but it nevertheless indicated the most satisfactory time of packing. It will be realized, of course, that this recommendation applies only to repairs where the small amount

of resin involved would not give rise to porosity through the exothermic reaction as would be the case with a denture.

TABLE 4
Stage of Packing
(Figures represent transverse breaking load in gm.)

Sandy	Stringy	Dough	Material
3,400 4,000	4,400 5,250	3,200 3,400	A
	6,500 7,000	5,000 5,400	C

5. *Provision for Positive Pressure during Curing:* How to produce and maintain a suitable pressure on such a small portion of the denture as covered by the repair was a difficult proposition which, however, was solved by the following procedure:—

- The repair was trial packed under pressure with little excess to ensure the filling of all recesses.
- Excess material was then added so that, on closing the flask with moderate pressure, about 1/16th inch flash spread over the area to be repaired. The excess beyond the repair was then trimmed off.
- The flask was closed again without pressure and left until the acrylic repair had reached the hard dough stage. The cellophane was then removed and full pressure applied.
- After five minutes the repair was cured.

It was only after this procedure had been adopted that the strength of the repair was equal to or approached that of the original material. The great improvement in strength obtained is indicated in Table 5.

TABLE 5
Method of Packing
(Figures represent transverse breaking load in gm.)

Normal Procedure	Recommended Procedure	Material
3,400 4,000 4,500 5,500	5,300 6,050 6,500	A
3,950	6,000	Average of 30 results for various materials.

6. *Curing Procedure:* The following curing methods were investigated, the first three being suggested in the technical and trade literature for curing dentures:—

- Heat flask in water at 70°C. (160°F.) for 2½ hours.
- Place in cold water, raise to boil in ½ hour then boil for ½ hour.
- Place in boiling water and boil for 10 minutes.

- (d) Place in boiling water and boil for a relatively long period ($\frac{1}{2}$ hour or 1 hour).

The recurring of a denture in boiling water has been demonstrated by a number of workers^{1, 9, 11} to give rise to shrinkage or warping. This occurs progressively each time a denture is flaked, heated and cooled owing to the thermal contraction of the acrylic resin after having been forced to conform to the rigid mould cavity during thermal expansion. Progressive shrinkage only occurs each time a new model is cast.

To minimise this shrinkage Vernon-Benshoff Co.¹⁴ and Osborne¹¹ have shown that a maximum curing temperature of 70°C. (160°F.), which is below the so-called softening temperature, should be used for repairs.

On the other hand, Vernon-Benshoff Co.¹⁵ have given evidence to show that to cure a full denture in a reasonable time and without porosity a minimum

TABLE 6
Curing Treatment

Water bath conditions for cure	Transverse strength, g.n.	Material
(a) 70°C. for 2½ hours	6,500	B
	6,700	
	6,800	
	7,000	
(b) Cold to boil in ½ hr., then boil for ½ hr.	5,500	A
	6,500	
(c) Boil for 10 min. (actual temperature reached by specimens 70-75°C.)	4,800	A
	4,800	
	5,000	
	6,000	
	4,500	B
(d) Boil for ½ hour	6,000	C
	6,100	
	5,500	A
	6,500	
	6,000	D
	6,400	
(d) Boil for 1 hr.	5,300	A
	7,100	
	7,100	
	8,100	
	6,000	F
	7,000	
	5,000	B
	5,800	
	6,000	
	6,100	
	6,500	
	7,000	

¹⁴ Vernon-Benshoff Co.—Some Effects of Reprocessing Polymerised Vernonite. Vernonite Work Bench, 6(4):1-3, 1947.

¹⁵ Vernon-Benshoff Co.—Don't Cure at less than 160°F. Vernonite Work Bench, 5(3):1-2, 1946.

preliminary temperature of 70°C. (160°F.), is required. The explanation given is that for the quantity of acrylic resin in an average denture, the peak due to exothermic heat in the temperature-time diagram is just high enough to give a satisfactory initial cure which is then completed by boiling in water after the peak has been passed. This curing temperature 70°C. (160°F.) which gives rise to the temperature peak in the large quantity of material in a full denture would not be expected to give the same result in the small amount of material in a repair, as there is very little exothermic heat evolved. Thus it was considered that a temperature higher than 70°C. (160°F.) might be required to give the repair material a satisfactory cure.

The results included in Table 6 indicate that all treatments investigated gave satisfactory strengths, with the possible exception of the 10-minute boil recommended by Osborne¹¹. Because of the danger of warpage the curing treatment at 70°C. for 2½ hours is recommended.

The possibility of warping can be further minimised by the cooling treatment which is considered in the following section. A check on dimensional change under these conditions is to be undertaken.

7. *Cooling*: Johnson and Matthews¹⁶, and Vernon-Benshoff Co.^{1, 17} have shown that it is just as important to cool an acrylic resin correctly as it is to cure it correctly. They consider that the slower the cooling rate the lower will be the internal stresses and thus the possibility of warping.

Pending further experimental evidence, the safest method is to bench cool fully or, better still, to allow the flask to remain in the curing bath overnight after the heat has been turned off.

RECOMMENDED PROCEDURE FOR REPAIRS:

From the results presented above there can be little doubt that the proper application of the various factors has produced consistently high repair strengths as against those produced by the earlier technique.

From these considerations it is recommended that the following repair technique be observed:—

1. Refit the broken denture and hold the parts together with sticky wax and matches or wires¹⁸.
2. Cast a model.
3. Remove the denture parts and prepare a smooth double V joint (Fig. 2) with ¼ to ½ inch separation. Finish the joint ends on a cotton buff with pumice so that all sharp edges are removed.
4. Apply an alginate separating medium to the model.
5. Replace the denture parts and wax up.
6. Invest the model and denture.
7. Place the closed flask in boiling water for 2 or 3 minutes and after a further 3 minutes remove the softened wax. Pour a thin stream of

¹⁶ Johnson, W. and Matthews, E.—Stress Studies in Acrylic Resins. B.D.J., 85(11):245-9, 1948.

¹⁷ Vernon-Benshoff Co.—How Rapid Cooling Makes Misfitting Dentures. Vernomite Work Bench, 8(7):1-2, 1949.

¹⁸ Swenson, M. G.—Complete Dentures, 2nd Ed., St. Louis, the C. V. Mosby Co., 1947, pp. 572-84.

boiling water over the joint to remove the last traces of wax, or heat the open flask for $\frac{1}{2}$ hour in water at 70°C. (160°F.). Remove any final traces of wax with a swab of cotton wool moistened with monomer but squeezed dry.

8. Just prior to packing, paint both ends of the joint with a very thin coat of acrylic cement. (1 part by volume of acrylic powder to 4 parts of monomer.) *Caution: The use of too much cement is likely to cause crazing.*
9. Use the acrylic mixture at the early dough stage while it is just sticky. (If packed too early, crazing will result with possible failure of the denture.)
10. Trial pack with very little excess under pressure to fill all recesses, using wet cellophane.
11. Add excess acrylic dough and close the flask with moderate pressure so that about 1/16 inch thickness of flash is produced. Trim to the limits of the repair. Close the flask without pressure.
12. When the acrylic dough has reached the hard stage remove the cellophane and close with pressure.
13. After 5 minutes heat the flask in water at 70°C. (160°F.) for 2½ hours.
14. Remove the flask and bench cool for as long as possible, or turn off the heater and allow flask to cool in the water overnight. (Ensure that the repair is cold. Remember that the plaster will be warmer than the outside flask.)
15. Remove denture, trim and polish.

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A PSYCHO-SOMATIC STUDY INTO THE NATURE, PREVENTION AND TREATMENT OF THUMB-SUCKING AND ITS RELATIONSHIP TO DENTAL DEFORMITY.*

A. G. H. LAWES, D.D.Sc.

PART III.

11. CASE DISCUSSIONS.

Case 1, Judith C.

Judith C. was born on 25th June, 1946, and was breast-fed from birth. She made quite satisfactory progress till about 2½ months, when she started sucking voraciously at her first and second fingers. No method of correction or treatment was attempted but at four months she started to lose weight and Mrs. C. was advised by the Baby Clinic Sister that her milk was deficient in nourishment. Breast feeding was then complemented with cow's milk and Karolac, and the baby very soon picked up and started putting on weight again. By 4½ months the feeding difficulty had been entirely corrected, baby was progressing normally and—very significantly—the finger-sucking which previously had been carried on so fiercely now ceased altogether. Breast feeding complemented with Karolac and cow's milk continued till 6 months when the process of finally weaning from the breast was commenced. At this time, too, Judith got her first two teeth. Feeding at the breast was cut down to five minutes at each feed, the balance being supplied per bottle, and vegetables were given at the 2 o'clock feed. By seven months weaning from the breast was complete and cow's milk and Karolac were given per bottle at each feed, with the addition of vegetables at 2 o'clock and porridge at 6 o'clock.

At 8 months, owing to what appears to have been a misunderstanding between Mrs. C. and the Clinic, the 10 o'clock feed was abruptly discontinued as the first step in weaning her from the bottle. Judith at once became upset at the 10 o'clock feeding time, cried, had difficulty in getting off to sleep and, within three days, she had started sucking fiercely at her thumb.

It appears to me, on discussing the situation with Mrs. C., that the abrupt termination of the 10 p.m. feed must surely have been a mistake and, furthermore, that in all probability this step had been taken too early. All the circumstances were accordingly brought before the Clinic Sister's notice, who agreed at once that some mistake or misunderstanding had occurred. The 10 p.m. feed was immediately resumed in full measure but Mrs. C. was instructed to start the weaning process again after 2 or 3 nights and to reduce gradually the amount of milk given by 1 oz. each night until the feed was finally suspended at 9 months.

Immediately the feed was resumed, Judith stopped sucking her thumb and her restlessness disappeared also. Of equal importance, too, is the fact that when, at the end of the gradual process, the 10 p.m. feed was finally discontinued,

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no thumb-sucking resulted. At the time of writing, Judith was 12 months old and had never recommenced thumb-sucking.

The delicate balance which must be maintained in the sucking-feeding routine of the human infant is thus exemplified very clearly in Judith's case. When she started sucking her fingers at the age of three months, she was getting all the physical exertion she needed from her sucking, but the nourishment which she was obtaining was deficient, and there can be little doubt that, in order to satisfy an infant's sucking-feeding instinct, something more than mere physical exertion is required. There are several requirements necessary and these must all be met in the right way and at the right time. The handling of this delicately balanced process of which the sucking act is the core requires the closest attention to detail, for the neglect of one requirement can, and often does, result in the whole instinctive drive being unsatisfied and, as a result, the infant turns to the substitute sucking of its thumb in its attempt to find complete satisfaction.

If, in Judith's case, the feeding routine had not been examined and corrected immediately the thumb-sucking commenced, it can easily be seen how the act would continue night after night, until it developed into a habit. It can be seen, too, how the denial of natural satisfaction for the sucking instinct turns a baby's attention in upon itself. It is able to derive a certain measure of satisfaction by sucking its own thumb but, as no nourishment is gained from it, the satisfaction is not a real one, but only a fantasy.

Case 2, Carol C.

Carol C. was aged 9 years at the time I examined her. The teeth were in a bad position, with the upper centrals pulled well forward and the lower incisors forced back by the action of the thumb. She sucks her right thumb only, with the volar surface uppermost and the fingers clenched and, whilst at home, the sucking action is an extremely vigorous one and is almost unceasing. She will even suck between courses at mealtime and whilst asleep and, if an attempt is made to remove her hand from her mouth whilst asleep, considerable force must be used.

At birth Carol weighed only 3 lbs., was first fed with an eye-dropper and then breast-fed. The mother suffered from kidney trouble during pregnancy and, in the light of all the circumstances, the saving of the baby's life was regarded as a great triumph and she was greatly fussed over and made much of in consequence. She is an only child and, for her first five years, her mother shared the responsibility of caring for her with a permanent nurse.

The mother says that thumb-sucking commenced at birth and has continued without slackening ever since. In an endeavour to break the habit, the nurse strapped the arms to her sides but the procedure was a complete failure. Immediately the strapping was removed, the sucking recommenced.

Mrs. C. now says that everything she can think of has been tried in her efforts to break the habit but all to no avail. She has put mustard, castor oil, triple dye, and aloes on her thumb at different times but Carol merely says she likes them and goes right ahead with the sucking. Finger-stalls have been fastened on the thumb with elasto-plast, but these are bitten through till the thumb is bared.

When her arms were strapped to her sides, she bit chunks out of the blanket and chewed them and, when the sheet was turned well down over the blanket, the

sheet was bitten through and the blanket again attacked. When the arm-strapping ceased, the thumb-sucking recommenced. The mother admits that she is over-anxious and at her wits' end and that she badgers the child ceaselessly to try to stop the habit. Carol spends most weekends with her grandmother who also badgers her about the habit.

Carol is very temperamental and gets very excited, an instance of this being the fact that she frequently gets so worked up over the weekly school sports day that she returns home with a headache and a rise in temperature.

At 8 years, splinting of the right elbow was tried. The splint was applied every day for three weeks immediately she returned from school, but the result was a complete nervous upset for both mother and child. Carol couldn't sleep or eat properly and became extremely irritable, and at the end of three weeks they were both so tired that the treatment was dropped and, of course, the thumb-sucking recommenced.

The whole situation seems to have assumed the proportions of a major issue with resultant nervous tension all round, from which there seems little hope of escape.

I interviewed Carol alone and she seemed a very pleasant, bright girl. She said she really wanted to stop her thumb-sucking because she knew the harm which she was doing to her teeth but she just could not manage it.

For a child of 9 years to suck her thumb as fiercely and as persistently as Carol does, a situation is revealed in which very considerable dental and psychological damage has already been done, and there is every probability of still further harm resulting without any prospect of the habit being dropped. It is quite certain, too, that no orthodontic treatment can be attempted until the thumb-sucking ceases.

No doubt there are several reasons why in some children the act persists, but one of these reasons is most certainly the misguided interference of well-meaning parents and others in their anxiety to break the habit. Very many children make their first visit to the dentist at about three years of age and the dentist should be equipped to give sound advice as to the correct method of handling the situation if at that time thumb-sucking is still indulged in.

No proper diagnosis, advice or treatment appears to have been given to Carol at an early age and, as a result, a mistaken approach to the problem has been persisted in for several years. The only results have been progressive dental and psychological damage, with the habit more firmly fixed than ever. It is surely quite wrong for dentists, on the one hand, to ignore this problem until obvious malformation of the jaw results, and then to resort to all manner of repressive methods to solve it; just as, on the other hand, it is equally wrong for them to over-emphasise the importance of the purely dental aspects of thumb-sucking in very young infants and, by frightening parents with the alleged dire results, to create a situation of tension about the child which will almost certainly result in the very thing they are seeking to avoid, namely, the continuance of the habit.

The dentist, therefore, should possess some sound scientific knowledge of child psychology, so that, when his young patients are presented to him with a history of thumb-sucking, it will be possible for him to assess the cause with some degree of accuracy and to advise the parents accordingly.

Carol's case history shows that she is the only child of an over-anxious mother, and over-anxiety on the part of the mother can have disastrous effects on the child.

Zoe Benjamin⁴ says:—"The over-anxious mother by her attitude alone causes irritability in the child; her nervous tension is conveyed to him and he too becomes nervous, irritable and resistant. Serenity and calm, which are fundamental to happy child guidance, should be cultivated because the assurance and poise which it gives the mother helps her to rise above many of the difficulties the child presents. It also has this advantage that, when the child realises he has little or no power to rouse her irritation or anger, the desire to do so dies away. Her serenity, therefore, gradually brings a greater peace to the child. There are many families in which the mother's attempt to control her own irritability and over-anxiety has changed a disturbed and quarrelsome household into a harmonious and co-operative one. If the child is to develop normally, he must live in a harmonious atmosphere, he must feel secure in the love and understanding of his parents. In such an atmosphere the possibility of the formation of bad habits is greatly minimised because the child will be happy. The child who is unhappy cannot be good."

From the time she was a tiny, premature, 3 lb. baby, Carol seems to have been surrounded by over-anxiety and tension on the part of her mother. At least two causes for the demonstrations of anxiety are known, the first being over the possibility of her survival, and the second over her thumb-sucking. This persistent tension is very probably the cause of her extreme nervous excitability. As regards thumb-sucking, Mrs. C. says that she has "tried everything," including persistent nagging which is still going on. As far as this is concerned, it is obvious that the more she nags the more Carol feels the need for security, comfort and solace, and the quickest and the easiest means available is that provided by sucking her thumb. She regresses to the comfort and security which she can obtain from her own body, and the more she sucks her thumb the more upset her mother becomes and so the vicious circle goes on.

An important point to remember, too, is that the nurse, in her efforts to break the habit, used to bind her arms to her sides. During infancy the nurse would be viewed in much the same light as her mother and any strong feelings called forth by the nurse's actions might very well have become fixed and represent Carol's attitude, not only to her parents as well, but also to teachers and all in authority over her. Watson⁵, it will be remembered, showed that the forcible hampering of an infant's movements called forth instinctive rage and temper, and the nurse's misguided efforts must surely have done this for Carol and have planted within her the seeds of a lasting resentment. The child's method of obtaining relief from the tension engendered was to suck her thumb immediately the restraint was removed. It is more than likely, too, that the act is used, unconsciously no doubt, as a means of revenging herself on her mother for the many scoldings, frustrations and indignities she has forced upon her. For a parent to show obvious distress at the sight of any act on the part of the child is simply to place in the child's hands a weapon which will most certainly be used in retaliation as the need arises.

No effort seems to have been made to build up Carol's own desire to drop the habit, to strengthen her by means of encouragement and co-operation, and to devise means whereby she could help herself and, yet, there is not the slightest

doubt that only through redirecting her energies into a more desirable activity and through the building up of her own morale is there any chance of the habit being dropped. Mrs. C. relates that her present approach is that, whenever she sees Carol with her thumb in her mouth, she says "Thumb," at which Carol is expected to take her thumb out of her mouth. In other words, a command is given and obedience is expected, despite the fact that Susan Isaacs²¹ says that "there are those sorts of behaviour which are of neurotic origin—nail-biting (thumb-sucking), stammering, sleeplessness—not one of these should be treated as a question of obedience."

Case 3, Janet L.

Janet L., aged twelve, still sucks her thumb fairly regularly, and her two upper centrals are considerably shortened as a result. I pointed this out to her and, at the same time, told her that I felt sure that in her own heart she wanted to give up her thumb-sucking. My friendly approach immediately brought forth a shy admission that this was so. The next step was to assure her of every possible help but, at the same time, it was made clear that she herself would have to overcome the habit and no one else could do it for her. She was immediately made to feel, though, that the problem was well within her capabilities by having explained to her the methods by which she could handle it. She was given chewing gum and I encouraged her to ask her mother for an apple when going to bed. I asked her when else she usually sucked her thumb and, when she said at the pictures, she was told that that would be easy to overcome—all that was necessary was to sit next to her mother on the left-hand side (she sucked her right thumb) and during the pictures to chew gum or else hold her mother's hand till the show was over. She was most interested and promised to try and carry these instructions out. A complicating factor had been her father's attitude, for he had been misguidedly reprimanding her whenever he saw her with her thumb in her mouth. It was suggested to Mrs. L. that a few tactful words might restrict the father's activities, and I explained the instructions which had been given to Janet.

Subsequent reports from the mother were that, without any prompting, Janet had asked for an apple going to bed and had welcomed the use of chewing gum. She had twice been to the pictures and, on the first occasion, without any prompting, had sat on her mother's left as suggested. Early in the show she had put her hand to her mouth and then, without any prompting, had suddenly taken it away and slipped her arm through her mother's, leaving it there for the rest of the show. On the next occasion, the hand had again travelled to the mouth and this time her mother had offered her some chewing gum. This was readily accepted and chewed for the rest of the show without any further thumb-sucking.

The struggle still goes on, but all the signs are that Janet herself is winning the battle. There is no tension surrounding it, no upsets, no hard words. It is safe to say that she will not only conquer her thumb-sucking but, having done so, her character will have grown in stature at the same time.

It should be noted that two important features are embodied in the suggested corrective routine, both of which, at Janet's age, are essential for success.

21. Isaacs, Susan.—The nursery years, London, George Routledge & Sons Ltd., 1943.

Firstly, her interest and active co-operation were aroused and, secondly, alternative activities were provided, into which the energy behind the thumb-sucking could be redirected.

Case 4, Andrew D.

Andrew D., now aged 5 years, was born a few months after his father departed overseas with the Army. After being a prisoner-of-war for 3½ years, the father returned to meet for the first time his son, aged 4. He is a well-developed, sturdy youngster who was breast-fed for about 6 months and had never at any time sucked his thumb. The father failed at first to understand his son and no doubt, too, he was suffering the nervous effects of his long captivity. He found it difficult to tolerate the inevitable noise, bustle and upheaval in the home where there is a young child. It seems that the father made excessive demands for good behaviour and discipline from his infant son, and the boy on his part could not understand this intruder who had suddenly appeared in the home. He was jealous of his mother's affections and showed signs of considerable emotional strain. To cap it all, shortly after the father's return, both mother and father went away for a holiday, leaving the boy in the care of his grandmother. This seemed to be convincing evidence that his mother's affection and protection had been withdrawn from him and it was at this time that the boy started thumb-sucking. His urgent need was for love and security, both of which he appeared to have lost, and so he turned himself to the sucking act which was so strongly associated with the feelings of love and security which he had previously enjoyed to the full, when he was an infant in his mother's arms. He reverted to an infantile practice, because by sucking his thumb he was able to escape from a cruel reality into a comfortable world of fantasy.

About twelve months after his father's return home, a baby sister was born and this event, as so often happens, brought with it problems of jealousy and the need for careful readjustment. The mother has taken great care to try and facilitate the readjustment, but this further disturbance is undoubtedly a big factor in keeping the thumb-sucking habit alive. At 5 years of age this practice is one that is most difficult to break and it will require considerable skill and understanding on the part of both parents before the boy will be able to throw it off.

12. THE QUESTIONNAIRE INVESTIGATION AND BEHAVIOUR OBSERVATIONS.

Many of the conclusions already arrived at in this thesis need the support of practical evidence as to the behaviour of infants and young children and, by carrying out an investigation on a large number of children of different ages and from widely different localities, it was hoped not only to obtain this practical evidence, but also to supply the answers to many aspects of the thumb-sucking problem which were not previously understood. For instance, it was hoped to throw some light on such matters as the influence of sex, age, methods of treatment, natural feeding as against artificial feeding, the effects of faulty feeding, and the situations in which thumb-sucking is usually indulged.

Thanks to the ready co-operation of the Lady Gowrie Child Centres and the Kindergarten Union of N.S.W., a large number of observations were recorded. The machinery of the investigation was by means of a questionnaire

which standardised the approach and, at the same time, embodied all the points on which information was required.

I became convinced of the necessity of starting the investigation from birth when I discovered that every thumb-sucker at the Lady Gowrie Child Centre was already confirmed in the habit when he or she first attended. As the practice was already well-established, research might be undertaken, but research into causes would have to be undertaken at a very much earlier age.

In framing the questionnaire, care was taken to make it as simple as possible but, at the same time, to leave room for individual comments and suggestions. The aim throughout was to try to discover any factors which might contribute to or cause the practice of thumb-sucking, and the questionnaire form was so designed that it could be used both for very young babies as well as for older children.

Eventually, two forms were decided upon—Form B and Form C—copies of which are shown in Figs. 33 and 34. In order to obtain observations from birth onwards, co-operation was sought and obtained from several institutions and personal interviews followed with the Superintendents of the Royal and Crown Street Women's Hospitals, Dr. Margaret Harper, the Matrons of Karitane-Sydney Plunket Mothercraft Centre, Tresillian Mothercraft Training Schools at Willoughby and Petersham, Carpenter House, Scarba House, the Secretary of Dalmar Children's Home and the Sisters in charge of Australian Mothercraft Society's Clinics, Elizabeth Street, Bondi Junction and Pymble.

In each case the object of the questionnaire was fully explained and, for the purpose of standardising the results, the exact meaning of various terms was agreed upon. Then, in order to complete this process of standardising the whole approach to the investigation, I attended a general meeting of representatives from all Kindergartens held at the Frances Newton Kindergarten and was afforded the opportunity of addressing the meeting and explaining the questionnaire in detail. Subsequently, results were obtained from 2,326 of Form C and 186 of Form B.

FORM C.

Form C is considered first, as being the more general of the two, and the total results of this investigation are shown in Table III. 39 different institutions filled in forms for the children under their control. Some were maternity hospitals handling new-born infants; some were Baby Health Centres caring for children up to about 12 months; some were Mothercraft Training Centres; some were children's homes; and others were kindergartens caring for children from two to five years of age. It may be fairly claimed, therefore, that a very broad field is covered and that the results obtained are as near to a typical cross-section of the whole community as it would be possible to obtain.

The aim being to try to discover any factors contributing to or causing the act of thumb-sucking, the first and most obvious one to be considered was the influence of sex. Table IV gives these figures and shows that neither sex has a preponderance of thumb-suckers. Of all children observed, 53.31% were males and 46.69% were females and, of the 558 thumb-suckers, 48.92% were males as against 51.08% females. The figures are so close that it is safe to say that sex, as a contributing factor, is non-existent.

The question of age is extremely important, for these answers should throw some light on such matters as when the habit starts, how long it lasts, and whether any particular age is more vulnerable than another. Reference to Table V shows that the percentage of thumb-suckers amongst all children observed was 23.99% and the highest average age at any institution was 4 years and 8 months. Comparing these figures with those for the 649 children aged 6 months or less, it is found that the percentage of thumb-suckers amongst these younger children is 23.57%. The indication is very strong that the practice of thumb-sucking almost invariably starts within the first nine months of life and that, once having started, it continues with little, if any, change, at least until the end of the pre-school years. There will, of course, be a few individual variations with a few children giving up the habit and also with a few starting it late but, in the main, there seems little doubt that the practice starts in early infancy and continues unchecked for several years. However, this question as to the age at which thumb-sucking usually starts is far too important to be left in any doubt, because it is fundamental to the planning of measures to be adopted for prevention and early correction. If it is true that in the majority of cases thumb-sucking starts in early infancy, then measures to be used must be appropriate to this stage of development. In an attempt, then, to establish beyond reasonable doubt the usual commencement age, a further survey was carried out in twelve kindergartens and at the Dental Hospital. Information was obtained from the mothers of all children who were known thumb-suckers and who were then attending these institutions (March-June, 1948), and results are shown in Table II. They provide striking confirmation of the information obtained from the questionnaire. The results show, too, that 93.27% of the children who were persistent thumb-suckers and who had an average age of 4 years and 1 month started the practice within the first nine months, and 72.1% of them started within the first three months of life. As the survey included more than 100 children distributed in widely different areas, and as it confirms in more detail the general deductions made earlier, the evidence is very strong that in the vast majority of cases the practice of thumb-sucking has its origin in early infancy.

Obviously, then, if the practice is to be brought under control, with emphasis upon prevention, attention must be focussed almost exclusively on infancy. The underlying causes must be sought primarily in early infancy, and measures for prevention and control must be devised which are based upon a knowledge of such causes. Once again, it is clear that the responsibility for this rests with the pediatrician and the Baby Health Centres for, by the time the dentist normally comes in contact with the persistent thumb-sucker, he is already addicted to the practice and patient treatment, based on sound psychological principles, is then called for.

That 23.99% of all children are persistent thumb-suckers carries very serious implications of great dental deformity, to say nothing of psychological damage. Just what percentage of older Australian children are thumb-suckers is not known, but it will be remembered that Johnson²² claimed that 10% of American children indulged in the habit for 10 years or longer. As his figures for younger children, 24.8%, correspond almost exactly with those I have

22. Johnson, Leland R.—The status of thumb-sucking and finger-sucking. J.A.D.A., 26:1245, 1939.

obtained, it is not improbable that the 10% that he mentions for older children applies to Australians as well.

Table VI shows the institutions at which observations of the children, aged six months or less, were made.

Treatment:

Questions 7 and 8 were included in an endeavour to ascertain what means of treatment were being used and with what measure of success they were meeting. If the answer to Question 7 was in the affirmative, then the answers to Question 8 became important, and particularly if the methods of treatment used were described. Table VII is a dissection of all answers to Question 8, both affirmative and negative. The extraordinary fact is revealed that, of the 345 efforts at controlling the habit, 271 or 77.98% of the total were complete failures. A closer investigation was then made in order to discover and classify the exact methods of treatment which had been used, and the results of this classification are shown in Table VIII. The methods of treatment recorded were examined and classified under six headings. They were:—

(1) *Purely obstructive.* Under this heading were classified such methods as splinting the elbows, applying sticking-plaster or evil-tasting substances to the thumbs or fingers, tying the hands to the sides, the use of gloves or mittens, or similar devices for physical restraint. Nagging and scolding were classified under this heading also, for there is no doubt that they are just as obstructive and negative in their effects as the more obvious physical means of obstruction.

(2) *Some obstruction, plus feeding correction.* It is the custom in many mothercraft centres to wrap the baby's arms and hands closely in its shawl and, at the same time, of course, every effort is made to bring the feeding routine to a state of perfection. Babies who have been treated in this way have not been included in Classification 1 because, although they have been subjected to some form of obstruction, the way is deliberately left open for them to get their hands free if the need is very great. At the same time the correction of the feeding routine is the really important factor.

(3) *Correction of feeding routine.* This section applies entirely to infant-feeding, and the recordings under this heading refer to a correction of feeding as the only method of treatment.

(4) *Redirection to some other activity.* Under this heading are included efforts at treatment designed to redirect the energy behind the thumb-sucking act into some other closely allied activity which is of a more desirable nature.

(5) *Use of the dummy.* This is really a special form of redirection but seems to be of sufficient importance to warrant special classification.

(6) *The promotion of self-interest.* Under this heading fall those types of treatment which contrive to coincide with the child's self-interest. It corresponds to the technique advocated by Susan Isaacs⁵ whereby the child is allowed, as far as possible, to experience the result of its own actions. If its own actions are harmful to itself and the child is able to realise this, then it is this situation which is included under this heading.

Unfortunately, a large number of forms—119—gave no indication of methods of treatment. Of those which did, however, 146 were classified under Section 1 as being purely obstructive in character and of this number 126 were complete failures. There are very many comments reporting the use of such methods as bitter aloes on the fingers, bandaging elbows, sticking-plaster and mittens.

A typical comment relating to obstruction is as follows:—"Leslie sucks two fingers when put down to sleep; mother tried gloves, but Leslie screamed so much that the gloves were discontinued and baby was allowed to continue the bad habit."

There was the usual failure in this case to discover the child's need and she was therefore obtaining a substitute sense of security and comfort from her thumb-sucking. How great her need was for this substitute is shown clearly by her deep distress when she was physically frustrated by the gloves.

The 11 cases of feeding correction were successful in every case and 18 out of 25 efforts at redirection were also successful. Section 6 also records 7 successes and no failures.

Treatment under these three headings, Nos. 3, 4 and 6, is based on sound scientific principles, whereas treatment of a purely obstructive nature, as recorded in Section 1, is quite devoid of scientific foundation. It is quite apparent that, up till now, obstructive methods have been relied on almost entirely for the control and treatment of thumb-sucking, and it is equally apparent that such methods will in the future have to be completely discarded and an entirely new approach brought to this problem. This new approach will have to be positive and helpful, and not negative and restrictive.

Methods of Feeding. It was felt that, if the feeding routine was a contributing factor in producing the onset of thumb-sucking, then the method or technique of feeding during infancy would be important. It seemed at first glance that the artificially-fed babies would provide most of the thumb-suckers, whilst the breast-fed babies would be more or less immune. Question 9 was designed to investigate the accuracy of this assumption and Tables IX and X give the results obtained. Of the thumb-suckers there were 547 answers to this question and these indicated that 44.79% were wholly breast-fed, 24.86% partly breast-fed and partly artificially-fed, and 30.55% were entirely bottle-fed. On the other hand, of the non-thumb-suckers 50.98% were entirely breast-fed, 21.51% were partly breast-fed and partly artificially-fed and 27.51% were entirely bottle-fed. The difference between thumb-suckers and non-thumb-suckers is not very great. There are many breast-fed babies who suck their thumbs, just as there are many who do not and, by the same token, there are many thumb-suckers and non-thumb-suckers amongst the artificially-fed babies. The explanation, as has been mentioned earlier, is that many babies whose feeding at the breast is unsatisfactory are helped to obtain complete feeding satisfaction by the breast-feeding being complemented or, in certain cases, by a complete change from breast-feeding to artificial feeding. When this is carefully done and full satisfaction obtained, the use of artificial feeding is actually a means of preventing thumb-sucking. If, however, the artificial feeding is not handled with great care, some measure of satisfaction will still be lacking, despite an otherwise general improvement, and then the thumb-sucking will probably continue. The figures in this section undoubtedly indicate that there is a greater chance of a failure to satisfy completely the sucking-feeding instinct when artificial feeding has to be resorted to, but the mere fact that a baby is entirely breast-fed by no means eliminates the possibility of failure. Subtle disturbances in either method can cause this.

Disturbances to the feeding routine. Still believing that the theoretical survey pointed strongly to the feeding routine as the basis of the development

of the habit, Question 10 was included to ascertain whether there was any connection between serious feeding disturbance and the development of the thumb-sucking habit. The total figures, however, give a very indefinite picture. It is now realised that the many subtle disturbances of the feeding routine which can be profoundly upsetting to the young infant may yet fail to attract enough notice to prompt the seeking of medical advice. Evidence of the effect of feeding, however, is very well shown in Table XI. In this table the figures obtained from the Tresillian Mothercraft Training Schools at Petersham and Willoughby, together with those from the Karitane Training College at Woollahra are compared with those from the Carpenter Mothercraft Home. Babies are admitted to Tresillian and Karitane specifically on account of feeding disturbances. They are either admitted alone, or with their mothers, for a correction of their feeding and the establishment of a sound routine. Carpenter Mothercraft Home, on the other hand, is designed to serve a different purpose. It is purely a convalescent home for mothers and babies after their discharge from hospital. The babies are all normal healthy infants. Conditions at Carpenter Home are quiet and restful for both mother and baby, and a comparison of the figures for these infants as opposed to those from the Tresillian and Karitane Centres is extremely significant. Of the 103 from Carpenter only 4, or 3.88%, were thumb-suckers, whereas of the 153 returns from Tresillian and Karitane 58, or 37.9%, were thumb-suckers.

Sister Convey of the Australian Mothercraft Society Clinic, Bondi Junction, after completing 135 questionnaire forms, made some very useful comments about what she believed to be the causes of the thumb-sucking habit. She believed the feeding situation was the basis of much of the trouble, the food being either insufficient in quantity or of a wrong type. She had often noted that, after an addition to or a change in the diet, the thumb-sucking ceased. She noticed, too, that in many cases the thumb-sucking took place after meals, and attributed this to the baby obtaining his food too quickly either from the breast or from the bottle. These comments are of great value, particularly as they coincide with many of the individual histories supplied on the questionnaire forms. For instance, the mother of Boyd F. aged 2 years 9 months says: "I have three children, all thumb- or finger-suckers, and I firmly believe that the habit, in their case at least, was caused by the fact that they received their milk too quickly—a full meal in five minutes."

Of Stuart B., aged 2 months, the report says: "At about two weeks he started sucking fists and fingers. He is overfed rather than underfed, but suffers a good deal from wind, which may be the reason for the fist-sucking."

Of Susan O'B., aged one week: "Baby only sucked thumb after taking bottle."

Of Kerith F., aged two weeks: "Admitted to the Karitane Mothercraft Centre to be established on a good feeding basis. Obtaining feedings too quickly when at breast—over-quota—but only sucking 8 minutes on one side. More settled after regulating and, if well wrapped up, unable to get at fingers."

In the case of this child and many others like her, there is little doubt that tight wrapping without first correcting the feeding routine would achieve nothing in the way of controlling thumb-sucking. Once the feeding has been corrected, however, the tight wrapping is merely a discouragement and is a useful adjunct.

Comment on Beverly N., aged three weeks, says: "Baby normal delivery but very sleepy at breast from birth and not sucking strongly. Admitted to be adjusted to a satisfactory feeding basis. Later much improved and able to suck at breast. Still inclined to suck fingers before feeding if she could reach them, but all right if well wrapped up."

Of Kerrie B., aged one month: "Baby instrumental delivery, very lethargic and jaundiced, not sucking strongly, and vomiting. Tube-fed for several days after delivery. Mother expressing four-hourly and milk supply increased to full quota. Baby bottle-fed with expressed milk then put back to the breast at three weeks. Condition improved—baby sucking well and obtaining full quota. Jaundice cleared and only inclined to cry and suck fingers occasionally."

During one of my visits to an orphanage in Sydney I had an opportunity to observe the feeding technique of six babies under six months. They were all in their cots with pillows arranged next to their heads, and their feeding bottles were propped up on pillows. The babies were then allowed to feed themselves.

I believe that it is generally accepted amongst pediatricians that, if a departure must be made from the natural breast-feeding procedure, the departure must be kept to a minimum and, if the need is for complete artificial feeding, then every aspect of the feeding routine should be so planned that, as nearly as possible, complete nutritional and emotional satisfaction should be ensured. It did seem to me that these babies were being deprived of an important emotional satisfaction through not being nursed at feeding time, and this factor might well contribute to an insufficient satisfaction of the sucking-feeding instinct resulting, in turn, in the search for a substitute satisfaction in the form of thumb-sucking.

General comments on the effects of maladjusted feeding are as follows:—

Helen McC., aged 11 months, "commenced finger-sucking at 4½ months when breast supply started to fail."

Robert M., aged 9 months—"only a finger-sucker whilst feeding not quite satisfactory. As soon as feeding increased and gains were satisfactory, the finger-sucking ceased."

Linette H., aged 2 months—"on admission to Tresillian North, baby was fed on modified cow's milk. She was under-weight and very unsettled. When discharged, baby was fully breast-fed, weight satisfactory and finger-sucking much less marked."

The extreme importance of the weaning process has already been remarked upon, and there can be little doubt that there is need for a very careful technique in which the closest attention is paid to every detail. The case history of Judith C. exemplifies this very clearly, and the following three comments are also quoted in support:—

"Still sucks thumb persistently. Was difficult to wean, is now very jealous of baby sister and has sucked thumb more persistently since she arrived." Incidentally, this comment brings out another factor which frequently operates to keep the thumb-sucking habit alive. The older child often feels that with the arrival of the new baby he has lost some of the attention which he enjoyed previously. He therefore feels less secure in his parents' affection and resorts to thumb-sucking in an effort to regain attention.

Other comments were:—"Did not suck fingers very much until after weaning." "Did not suck thumb at all until weaned. Various remedies tried without success."

If we consider all these results in conjunction with the effects of frustration of the feeding instinct noted amongst calves, and remembering, too, the opinion expressed by the Superintendent of the Royal Hospital for Women, the evidence becomes altogether conclusive that a disturbance in one way or another of the sucking-feeding instinct is by far the commonest cause, and probably the only cause, of thumb- and finger-sucking amongst infants under 12 months of age.

It should be recognised, though, that not every child will act similarly, given similar conditions. Some infants with feeding disturbances might not suck their thumbs or fingers at all. They might find substitute satisfaction in some other way, or they might exhaust themselves seeking such a substitute and not finding it. What is claimed, though, is that when thumb-sucking does occur in infants it is evidence that the sucking-feeding instinct is being incompletely satisfied.

The relatively few children who turn to thumb-sucking after the normal weaning time do so for different reasons, and the principal of these is the search for security. It is an attempt to regress to an infantile state and will usually be caused by some severe emotional upset.

FORM B.

These forms were used in an investigation by kindergarteners to ascertain the situations in which kindergarten children indulged in the thumb-sucking habit. The results obtained from twenty-four kindergartens are shown in Table I. The total number of days on which observations were made was 2,402, and this figure also represents the maximum which could be recorded in any one situation. It will be seen at a glance that at kindergarten age the sleep situation is by far the commonest in which the habit is indulged in, and the going-to-sleep period is almost invariably used by the persistent thumb-sucker. Periods of boredom show the next highest recordings after the going-to-sleep and sleep periods and, after that, story-time showed a high recording. These situations were a long way ahead of all others for which observations were carried out. The pleasurable feeling of comfort, protection and security when tucked up in bed is strongly reminiscent of the comfort, protection and security experienced as an infant in his mother's arms, and the process of modification previously dealt with explains how the sleep situation becomes the commonest in which thumb-sucking occurs. It has been shown previously that, when thumb-sucking persists after the normal weaning time, it is the continuance of an infantile practice. It promotes fantasy feelings of comfort, protection and security, and thus the fantasy situation of story-time gives rise to the accompanying habit of thumb-sucking, just as the fantasy situation in connection with the arrival of Santa Claus did. When the child is bored or unoccupied, it finds solace by retreating into its fantasy world.

It is noteworthy that at this age the feeding situation has become relatively unimportant. The process has undergone considerable modification and the original cause which was associated with the infant-feeding routine has now been lost sight of. When the child has reached kindergarten age and is still thumb-sucking, it is of great importance that the practice be cured at the earliest

possible moment. If this can be done before the permanent teeth erupt, and if the amount of deformity is not too great, or secondary habits of lips and tongue are absent, there is a strong chance that the permanent teeth, in erupting, will make the necessary correction to any slight malocclusion. The results of the Form B investigation point strongly to the means by which control can be achieved. Means must be found for removing the necessity for the child to seek security and comfort from its thumb-sucking fantasy. There are very many comments to show that children will retire into themselves when faced with a situation which seems beyond them. Many children are shy and embarrassed when confronted with strangers. They don't know how to act, the situation is a bit beyond them, and they seek the unreal sense of security which they can derive from thumb-sucking. It would seem, then, that the great need is to protect these children from such situations but at the same time to train them gradually to stand on their own feet. The sleep situation will probably be the last in which the thumb-sucking will be indulged in, and patient and careful handling will help the habit to disappear. If the mother or mother-substitute could sit by the child's cot at sleep-time, perhaps hold his hand or provide some physical contact and nothing more; if the atmosphere were quite friendly and quiet; and if this routine were patiently observed for some weeks on end, I believe that the sense of security and comfort derived from the mother's presence would be a real one and would gradually replace the unreal one promoted by the thumb-sucking. Very many of the kindergartener's comments indicate considerable improvement in dropping the thumb-sucking habit after the child's attendance at kindergarten. In many cases this seems due to the child being subjected to very faulty handling at home, and the improved handling at kindergarten has brought about improved behaviour. This is shown very clearly in the duplicate B Forms submitted for Florence L. of Phoenix Kindergarten. In eight days of observations at the kindergarten, Florence was observed thumb-sucking on only five occasions whilst in a similar period at home her thumb-sucking was almost continuous, and the number of separate recordings made for the equivalent period was 63.

Other comments reflecting the effects of home environment as against that at kindergarten are as follows:—

Paul F., aged 3 years 8 months: "Paul never sucks thumb or fingers at kindergarten, but his mother says he always has his thumb in his mouth at home."

Margaret P., aged 5 years 1 month: "Child even now persistently sucks her thumb when going to sleep, although she used to do so any time in the day. Has become less inclined to do so during the day since she started at kindergarten."

Robert B., aged 4 years 1 month: "Only sucks his thumb when going to sleep at night. Since coming to kindergarten he no longer sucks his thumb during the day."

There are many other comments in a similar strain to these, all of which suggest faulty psychological handling at home as the factor tending to keep the habit alive.

Very many comments have been made, describing accessory movements made with the other hand during thumb-sucking. Some typical ones are as follows:—

"Child now sucks thumb persistently while sleeping and before overtaken

by sleep—rubs tip of nose rhythmically with the index finger of the same hand and twists hair with the other hand.”

“Martin sucks his thumb only when he has a blanket, *i.e.*, only at night when going to sleep. His thumb-sucking seems associated only with a special small blanket—‘his baby blanket’.”

“Wayne has a habit of holding a woollen blanket close to her mouth whilst sucking thumb and, at the same time, working her fingers until she rolls a small ball of wool off the blanket which she puts in her mouth and swallows. When we won’t give her a blanket at night, it is nothing to see her kneeling down beside baby’s cot and using baby’s blanket through the railings. We have her on an iron tonic to see if this will supplement any deficiency.” (Mother’s description.)

“Child sucked thumb from an early age when tired and when put to bed. The action would always take place when child came in contact with any woollen or soft material such as singlet, fur, blanket, etc.”

No attempt has been made to investigate the meaning of these accessory movements as they seem to have little direct bearing from a dental point of view. They are very common, however, and attention is drawn to them here and to the need for further research in order that they may be fully understood.

13. SOME SELECTED CASE HISTORIES.

Theoretical considerations, the questionnaire investigation, and previous case discussions have all suggested very strongly that in an imbalance of the feeding routine or, more particularly, in an imbalance of the sucking-feeding instinct is to be found the original cause of most children starting the practice of thumb-sucking. In order to investigate this more closely and to obtain detailed first-hand information, I spent some time over a period of 3-4 months personally attending a number of clinics, interviewing mothers of thumb-suckers and collecting their histories. The effort was made to standardise the information as much as possible and, to this end, the questionnaire form was used as a basis and, in addition, the following information relating to the feeding routine was sought:—

- (a) Weight increases, digestion, general condition.
- (b) Rate of feeding.
- (c) Times of feeding.
- (d) Atmosphere at feeding time.
- (e) General.

Some of the mothers have been interviewed several times and the histories obtained have been summarised and certain facts condensed into table form (Table XII). The clinics at which this work has been carried out are the King George V Post-Natal Clinic, Australian Mothercraft Society’s Clinics at

Elizabeth Street and Pymble, Tresillian North Mothercraft Training School, and the Pedodontia Department of the United Dental Hospital. Further histories were obtained from my own practice.

Taken on their own, these histories would have to be treated with reserve because the numbers are limited—they are compiled almost entirely from information supplied by the mothers and, for obvious reasons, it was quite impossible to establish control groups as was done with the calves. If, however, the results of these histories are considered in conjunction with the results of the questionnaire and also in conjunction with the observations of calf behaviour, the whole does provide very strong evidence that the origin of thumb-sucking is nearly always found in a disturbance of the infant-feeding routine. Furthermore, the evidence is very strong that, of the various ways in which this disturbance can come about, probably the commonest is the over-rapid feeding of the infant at the breast, resulting in a lack of satisfaction of the instinctive sucking act.

Levy²³ has previously drawn attention to the close connection between an over-rapid flow of breast milk and the onset of thumb-sucking, and he gives 11 case histories of thumb-suckers in which the factor common to all was the rapid flow of breast milk. Of 28 other cases of thumb-sucking he says: "24 are traceable to some feeding difficulty—primarily, the sucking phase of the feeding act."

These observations coincide with my own but the significance of instinct seems not to have been appreciated by him whereas, of course, in my view it is of fundamental importance for an understanding of the whole phenomenon of thumb-sucking.

Of my 45 histories, 41 report one or more discernible defects in the feeding routine. In Table XII over-rapid feeding is included under the general heading "Discernible feeding disturbances" but, in view of its importance, it has also been separated under a special heading of its own. Of the 45 histories, 26 report this defect. It was noticeable during my investigations that, if the baby's physical condition was satisfactory, despite the over-rapid feeding—and in many cases this was so—then little if any notice was taken of this defect, either by the mothers or nurses. If, however, it is accepted as being one of the major factors causing an imbalance in the feeding routine and, in turn, giving rise to the practice of thumb-sucking, then very close attention will have to be given to it in the future.

Although it has no direct bearing on the problem of thumb-sucking, it is interesting to note the number of cases in which a copious supply of breast milk was followed at 4-6 months by a drying up of the supply, necessitating complementing or weaning.

The recorded results of attempts to control thumb-sucking by various methods of obstruction are of very great importance because, in all 14 cases where these methods have been tried, the result has been complete failure. This coincides entirely with the previous results shown in Table VIII and provides striking confirmation of the correctness of the theoretical approach to the problem as set out in Part I.

23. Levy, David M.—Finger-sucking and accessory movements in early infancy, *Am.J. of Psychiatry*, 8:881, 1928.

UNITED DENTAL HOSPITAL.

Josephine McI. History taken 20.6.48, aged 6 years 5 months. Breast-fed for five weeks only. For the first three weeks after return from hospital baby was continually screaming, and upset and unsatisfied. Mother and baby were admitted to Carpenter House in order to test feeding technique and to establish a proper routine. Tests revealed that the mother's milk supply was very deficient and baby was very much underfed as a result. Thumb-sucking started within the first three weeks of life and continued till five years of age. Breast-feeding was complemented, whilst at Carpenter House, and baby was then satisfied and continued to show satisfactory progress. At 3½ months baby was weaned and bottle-feeding resorted to. When three months old, various obstructive methods were tried—aloes, mittens, finger-stalls, etc. At the end of one week's determined efforts, the baby was so seriously upset that all were discarded. A dummy also was tried but this was refused.

At the age of 5 years Josephine hurt her left arm. This required bandaging for some weeks and the arm had to be carried in a sling. As it was her left thumb which she used to suck and it was now impossible for her to do so, she was very upset for several days, and feeding and sleep situations were seriously disturbed. No attempt was made to suck the other thumb and, eventually, when the bandages were removed, thumb-sucking was not resumed.

Malcolm McI. History taken 20.6.48, aged 1 year. Breast-fed for only one month. Some tendency to thumb-sucking observed in first few weeks—dummy given and used for three weeks only and refused. Malcolm is Josephine's brother and, after her previous experience, Mrs. McI. says that she paid close attention to his feeding from birth. He was complemented even during the first month at the breast and satisfactory progress has been maintained throughout. Early tendency towards thumb-sucking soon disappeared and the practice has never shown itself since.

Norman C. History taken 7.7.48, aged 6 years. Breast-fed. Mrs. C. reports having had a very copious and quick flow of milk, resulting in baby obtaining feeds very rapidly, seldom taking more than 10 minutes at each feed. Mother had considerable difficulty in drying off her milk at weaning time. Thumb-sucking started between six and nine months of age and has continued ever since. Aloes, mustard and bandages were all tried without avail and, then, at the age of 4-4½ years the arm was bandaged firmly to the boy's side when he went to bed at night. This, too, was quite useless because he would struggle and contort himself until, eventually, he could get hand to mouth. No discomfort seemed too great, as long as the thumb could be sucked. When these measures proved complete failures, metal thumb-guards were constructed, consisting of stout metal cylinders inside which were cloth finger-stalls and tapes for tying round the wrist. These thumb-guards were tied on every night for twelve months and Norman would frequently suck guard and all. At the end of 12 months the use of the thumb-guards was discontinued in the hope that the habit had been broken, but the thumb-sucking was immediately resumed. (See Figs. 29-32 inc.)



Fig. 29.—Norman C., whose case history appears on page 288.



Fig. 30.—Norman C. demonstrates the heavy metal thumb-guards which had been used over the previous twelve months in an attempt to break him of the thumb-sucking habit. His facial expression is certainly not that of a happy, well-adjusted child.

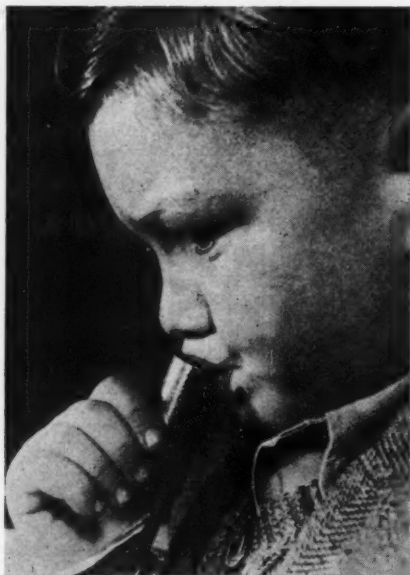


Fig. 31.—Norman C. frequently thumb-sucks despite the cumbersome thumb-guard.

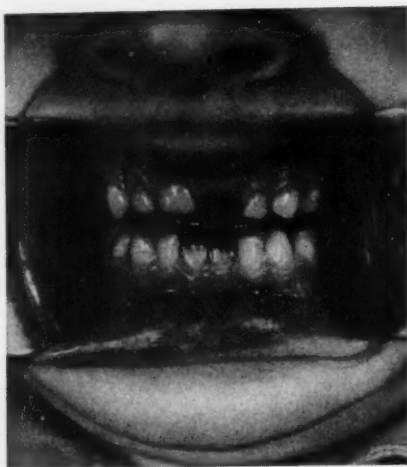


Fig. 32.—The bite is somewhat open as a result of the thumb-sucking, but the malocclusion is not severe.

KING GEORGE V POST-NATAL CLINIC.

Kay H. History taken 19.5.48. Aged 8 weeks. Breast-fed. Mother's milk supply is very free and baby obtains nourishment very quickly. Mrs. H. says average feeding time in hospital was only 2-3 minutes and now is only 7 minutes. One side only is taken, as baby refuses the other.

Atmosphere at feeding time is far from good as Mr. and Mrs. H. live in one room, there are eight people in the house, and there is constant noise and distraction.

David M. History taken 12.5.48. Aged 5 months. Breast-fed. Weight increases of 8-9 ozs. per week maintained for first three months. For some undiscovered reason, over the next six weeks gains averaged only 1-1½ ozs. per week. Thumb-sucking started at 4 months. Feeding has always been very rapid with an average time of only 5 minutes. Test feed at three months resulted in 7½ ozs. in five minutes. Mrs. M. reports that she always wears a napkin over her breasts to absorb the milk which flows spontaneously. Baby hardly has to suck at all to obtain his milk.

Stephanie C. History taken 12.5.48. Aged 3 days. Breast-fed. Three older children in the family and all are persistent thumb-suckers. Stephanie is now starting to suck her thumb also. The older children all started the practice before they were three months old. Mrs. C. reports that all were able to feed very quickly, owing to a very free milk supply. Stephanie is now taking only 10-12 minutes, and she has to be sat up every now and then to stop her from choking.

Vicki C. History taken 26.5.48. Aged 8 months. Breast-fed. Thumb-sucking started at 6½ weeks. At 2½ weeks she had a test feed and took six minutes on one breast and three minutes on the other for a gain of 5 ozs. Vicki has always been able to feed very quickly and never at any stage taken as long as 20 minutes. Average time taken has always been between 12-15 minutes. Mrs. C. reports milk flow always very free and would often flow spontaneously.

TRESSILLIAN NORTH MOTHERCRAFT TRAINING SCHOOL.

Philip McC. History taken 30.6.48. Aged 5 months. Artificially-fed. Mother died during childbirth and baby was very difficult to get established on to artificial feeding. He always appeared hungry and unsatisfied and for some time he failed to put on weight. He is now gaining well and is much more satisfied, but is still sucking two fingers. This practice started within the first month.

Gregory McD. History taken 30.6.48. Aged 3 months. Breast-fed for three weeks, then artificially-fed. Has vomited since birth and vomiting getting worse. Cries day and night. He sucks four fingers consistently.

FROM MY OWN PRACTICE.

Stephanie W. History taken 25.6.48. Aged 21 months. Breast-fed for three months, complemented till six months and then artificially-fed. Started

thumb-sucking within the first month. Breast-feeding was always very rapid, 10-12 minutes being the usual feeding time. Complement was given at three months owing to milk supply becoming inadequate. Thumb-sucking was very marked whilst baby fed exclusively at the breast but, when complemented, Mrs. W. acted on my advice and so adjusted the teat that the feeding time was slowed down to a full 20-25 minutes. In addition, baby was kept well wrapped when put down to sleep. Thumb-sucking very soon ceased and has not been resumed.

AUSTRALIAN MOTHERCRAFT SOCIETY, ELIZABETH STREET CLINIC.

Graham A. History taken 26.5.48. Aged 5 months. Artificially-fed throughout. Thumb-sucking started at three months and gloves were used to try and stop it but without success. Baby upset in last month and has had some vomiting bouts. Weight increases have dropped also, averaging only 3 ozs. per week for the last three weeks. By 23.6.48 Graham was much better and normal weight increases resumed. Rusk and vegetables have been given during the last week. Lower centrals have just erupted. Thumb-sucking has almost ceased.

Peter B. History taken 7.7.48. Aged 11 months. Breast-fed till six months, then complemented till nine months and then weaned. Weight increases well maintained throughout, but milk supply very free and baby always obtained his food very quickly, usually only 5 minutes at each breast. Now has 8 teeth.

Gloves and mittens were used in an endeavour to stop thumb-sucking, but baby became very distressed and the attempt was given up as useless.

Trudie B. History taken 7.7.48. Aged 8 months. Breast-fed. Caesarean birth. Mother and baby spent two weeks at Carpenter House after discharge from hospital. Great difficulty was experienced in establishing baby on a satisfactory feeding routine and for some time she refused to feed at all from the right breast. Thumb-sucking started at about this time. When, at last, feeding routine was established, milk supply was extremely free and copious. After discharge from Carpenter House till six months of age, baby was given only five minutes at each breast at each feed. Efforts were made to slow the feeding process by alterations in the posture of mother and baby, and various types of nipple-shields were also tried, but without appreciable effect.

Mother had to use a towel at night to absorb the excess flow of milk.

For the last six months, baby's progress has been very satisfactory. She now has four teeth.

AUSTRALIAN MOTHERCRAFT SOCIETY, PYMBLE CLINIC.

Robin G. History taken 17.5.48. Aged 11 months. Breast-fed till six months and then weaned. Thumb-sucking started within the first two weeks and got steadily worse. Baby took food well till three months old, and then started to fight against it. She has been difficult to feed ever since. Mrs. G. reports that flow of breast milk was always very rapid and one test feed revealed that the normal ration was supplied in five minutes.

Living conditions have also been very difficult for this family and, for three months from the time the baby was three months old, they lived in a one-room flat where they were subjected to constant noise and distraction. Mrs. G. says that she became very upset and disturbed herself at this time.

FORM B.

QUESTIONNAIRE FOR KINDERGARTENERS.

For use with each individual child, each day over a period of at least 2 weeks. Please indicate with a tick the situations during which thumb- or finger-sucking takes place.

	Day 1	Day 2	Day 3	Day 4	Day 5	TOTAL	REMARKS
1. On arrival at Kindergarten							
2. During medical inspection							
3. <i>During play</i> :							
(a) Playing happily							
(b) Quarrelling							
Other play situation :							
(c) (Specify)							
4. When bored or unoccupied							
5. At story time							
6. Going to sleep							
7. Whilst asleep							
8. Just before meal							
9. At meal time							
10. Just after meal							
11. <i>When physically upset</i> :							
(a) Sick							
(b) Hurt							
(c) Tired							
12. Emotionally upset							
13. Specify any other							
14. Situations							

Fig. 33.

TABLE I.
AFFIRMATIVE RECORDINGS.

NAME OF KINDERGARTENS.	B. FORMS.																								
	Number of Thumb- suckers observed	Total number of days on which observations made of all thumb-suckers	Maximum affirmative re- cordings possible	1. On arrival at Kinder- garten	2. During Medical Inspection	3a. Play Happily	3b. Play Quarrelling	3c. Watching others	4. Bored or unoccupied	5. At story time	6. Going to sleep	7. Whilst asleep	8. Just before meal	9. At meal time	10. Just after meal	11a. Sick	11b. Hurt	11c. Tired	12. Emotionally upset	13a. Miscellaneous	13b.	14a. When disciplined	14b. At music time	14c. When insecure	
L.G. C.C. Perth	18	211	211	26	17	23	—	—	69	68	158	109	32	16	9	—	9	8	43	—	—	6	14	23	
L.G. C.C. Sydney	8	101	101	1	13	—	6	—	41	31	99	70	24	10	10	—	15	27	28	4	—	—	3	—	
L.G. C.C. Adelaide	3	44	44	—	—	—	—	—	1	1	15	4	1	1	1	—	—	4	3	—	—	—	—	—	
L.G. C.C. Hobart	22	302	302	91	26	52	62	65	123	127	237	130	65	31	26	1	24	84	31	32	13	—	45	—	
Woolloomooloo	6	86	86	25	—	6	2	6	34	23	64	54	8	6	3	—	1	8	20	—	—	—	—	—	
Crusader	13	195	195	73	41	47	9	15	36	51	194	142	98	31	41	3	8	1	16	2	—	—	—	—	
Parramatta	8	105	105	25	—	—	—	—	47	2	76	31	3	20	1	—	—	1	1	2	—	—	—	—	
Newtown	3	24	24	—	—	—	—	—	4	—	17	—	—	—	—	—	—	6	—	—	—	—	—	—	
Globe-Marrickville	3	41	41	—	4	1	2	2	14	5	38	37	10	—	—	—	—	—	—	—	—	—	—	—	
Cheltenham	11	131	131	2	7	—	5	11	1	1	130	51	10	—	8	—	—	—	—	3	—	—	4	—	
Lance	4	47	47	16	14	—	—	—	30	16	43	17	7	15	12	—	—	17	15	—	—	—	—	—	
Croydon	14	137	137	—	—	—	—	2	8	35	114	4	2	11	—	—	7	23	7	1	—	—	3	—	
Golden Fleece...	2	28	28	3	2	10	—	3	14	14	24	14	14	—	14	—	14	21	16	—	—	—	—	—	
Frank Saywell	6	90	90	10	—	12	6	—	38	24	87	87	16	3	3	4	3	11	7	—	—	—	3	—	
Peter Pan	15	202	202	9	13	9	—	14	38	33	70	37	—	13	—	—	—	1	15	10	—	—	11	1	
Waverley	11	153	153	5	8	9	7	5	53	31	110	46	9	16	8	—	3	42	18	—	—	—	—	—	
Killara	10	111	111	17	—	9	—	3	20	23	85	34	10	2	3	—	1	3	3	1	—	—	12	—	
Frances Newton	3	43	43	4	3	1	—	6	6	—	27	23	—	1	—	—	—	—	—	—	—	—	—	—	
Wickham	8	108	108	31	19	18	18	85	40	100	88	84	18	60	4	13	4	28	18	—	—	—	7	—	
Blue Bird	3	45	45	15	—	12	3	11	11	44	24	24	1	6	12	5	—	4	3	2	—	—	—	—	
Samuel Cohen	2	30	30	11	—	—	3	10	3	18	—	—	1	—	—	—	—	—	—	—	—	—	—	—	
Surry Hills	8	96	96	22	4	8	—	10	14	44	71	31	1	10	5	—	6	19	7	4	—	—	2	—	
Maybank	4	60	60	6	—	12	13	—	15	25	56	15	4	—	—	—	2	—	—	—	—	—	—	—	
Phoenix	2	12	12	4	—	4	—	—	5	4	3	—	—	—	1	—	—	—	1	7	—	—	—	—	
TOTALS	186	2402	2402	396	179	233	152	123	717	631	1880	1048	410	214	218	17	110	305	282	87	—	19	104	24	

TABLE II.

Name of Institution	Number of thumb-suckers at 1 June, 1948	Numbers who commenced thumb-sucking at these ages				Children's ages at 1/6/48		
		0-3 mths.	3-9 mths.	9-12 mths.	Over 12 mths.	Age of youngest thumb-sucker	Age of oldest thumb-sucker	Average Age
Dental Hospital ...	6	3	3	—	—	1 y.	6 y. 5 m.	5 y. 3 m.
My own practice ...	6	5	—	—	1	1 y. 9 m.	10 y.	5 y. 10 m.
Croydon Kindergarten	8	8	—	—	—	3 y.	4 y. 10 m.	3 y. 10 m.
Frank Saywell "	6	5	1	—	—	1 y. 6 m.	6 y. 4 m.	3 y. 10 m.
Woolloomooloo "	4	2	2	—	—	2 y. 7 m.	4 y. 6 m.	3 y. 9 m.
Parramatta "	4	4	—	—	—	3 y. 7 m.	4 y. 8 m.	4 y. 1 m.
Peter Pan "	15	11	1	—	3	2 y. 6 m.	6 y.	4 y. 2 m.
Crusader "	11	10	1	—	—	3 y. 1 m.	4 y. 11 m.	4 y.
Frances Newton ...	2	2	—	—	—	3 y. 2 m.	3 y. 3 m.	3 y. 2½ m.
Maybank ...	4	3	1	—	—	3 y. 2 m.	4 y.	3 y. 7 m.
Samuel Cohen ...	1	1	—	—	—	4 y.	4 y.	4 y.
Killara Park ...	13	7	4	—	2	3 y. 8 m.	5 y. 4 m.	4 y. 5 m.
Cheltenham ...	19	12	6	—	1	1 y. 10 m.	6 y.	4 y. 3 m.
East Chatswood ...	5	2	3	—	—	3 y.	4 y. 6 m.	3 y. 2 m.
TOTALS ...	104	75	22	—	7	1 y.	10 y.	4 y. 1 m.
PERCENTAGES ...		75-72.1%	75+22-97=93.27%					

FORM C.

QUESTIONNAIRE.

N.B.—Please select any children at random—not necessarily thumb suckers—and fill in a separate form for each child.

Where squares appear, indicate answers with a cross.

1.
Name of hospital or institution.....

2.
Baby's name.....

3.
Sex
Male ☐ Female ☐

4.
Date of birth.....

5.
Date of filling in this form.....

6.
Does child suck finger or thumb persistently—that is, at some time or other during every day? Yes ☐ No ☐

7.
If child has been a thumb or finger sucker, have any efforts been made to break the habit? Yes ☐ No ☐

8.
Were the efforts used to break the habit successful? Yes ☐ No ☐

9.
How is, or was, child fed as a baby?
Wholly breast ☐
Breast supplemented with bottle ☐
Wholly bottle ☐

10.
Is, or was, feeding as a baby sufficiently difficult to require medical advice, admission to hospital or special treatment? Yes ☐ No ☐

11.
Please add any further comments referring specially to thumb or finger sucking which you think might be helpful—e.g., methods used to break the habit, etc. :—

.....
.....
.....

This return should be based on an observation covering at least seven consecutive days.

Fig. 34.

TABLE III.

[illegible]

TABLE III.—(Continued).

[illegible]

N.B. Totals do not cover check in every cage because many forms were incompletely filled in.

* All babies with feeding problem.

†All with feeding difficulties but younger than (1).

TABLE IV.

Sex.									
Total number of children observed	...	...	...	...	...	...	...	...	2326
Total number of males	...	...	...	...	...	...	...	...	1240
Percentage of males	...	...	...	...	...	...	...	...	53.31%
Total number of females	...	...	...	...	...	...	...	...	1086
Percentage of females	...	...	...	...	...	...	...	...	46.69%
Total number of thumb-suckers	...	...	...	...	...	...	...	...	558
Total male thumb-suckers	...	...	...	...	...	...	...	...	273
Percentage of male thumb-suckers	...	...	...	...	...	...	...	...	48.92%
Total female thumb-suckers	...	...	...	...	...	...	...	...	285
Percentage of female thumb-suckers	...	...	...	...	...	...	...	...	51.08%

TABLE V.

Age.									
Total number of children	...	...	...	...	...	...	...	...	2326
Total number of persistent thumb-suckers	...	...	...	...	...	...	...	...	558
Highest average age at any school or institution	...	...	...	...	...	...	4 yrs	8 mths	
Percentage of thumb-suckers of all children	...	...	...	...	...	...	...	...	23.99%
Total number of children aged six months or less	...	...	...	...	...	...	...	...	649
Number of thumb-suckers aged six months or less	...	...	...	...	...	...	...	...	153
Percentage of thumb-suckers aged six months or less	...	...	...	...	...	...	...	...	23.57%

TABLE VI.

Children aged six months or less.

	Total Observa- tions	Number of Thumb- suckers
Aust. Mothercraft Society Clinic, Bondi Junction	135	28
Royal Hospital for Women	196	37
Crown Street Hospital for Women	62	26
Karitane Mothercraft Centre	26	15
" " " " " " " "	17	7
Carpenter " " " " " " " "	103	4
Tresillian, Petersham	25	9
Tresillian North	85	27
	649	153

TABLE VII.

Treatment.

Number of recorded efforts at treatment (Total of all answers to Question 8)	...	345
Number of successful results	...	76
Successful results expressed as percentage of total	...	22.02%
Number of unsuccessful results	...	269
Unsuccessful results expressed as percentage of total	...	77.98%

TABLE VIII.
DISSECTION OF ANSWERS TO QUESTIONS 7 AND 8.

Institution	Answers to Q. 8		METHODS OF TREATMENT RECORDED										No treatment recorded	
			Purely obstructive. Splinting, aloes, naging, etc.		Some obstruction (such as tight wrapping) plus feeding correction		Correction of feeding routine		Re-direction to some other activity		Use of dummy		Promotion of self interest. T. S. having caused sore on finger, etc.	
	Yes	No	Suc.	Fail.	Suc.	Fail.	Suc.	Fail.	Suc.	Fail.	Suc.	Fail.	Suc.	Fail.
<i>Women's Hospital</i>	4	23	—	3	—	—	3	—	—	—	—	—	—	21
Royal, Crown Street	2	13	1	4	—	—	—	—	—	—	—	—	—	10
<i>Mothercraft Tng. Sch.</i>	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Tresillian Nth.	Nil	—	—	—	—	—	—	—	—	—	—	—	—	—
Tresillian Petersham	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Karitane Woollahra (1)	6	4	1	4	—	—	2	—	—	—	—	—	—	3
Karitane Woollahra (2)	5	2	—	—	3	—	4	—	—	—	—	—	—	—
Carpenter M'ett. H.	Nil	—	—	—	—	—	—	—	—	—	—	—	—	—
<i>Baby Clinics</i>	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Aust. M'craft S. Bondi	5	1	1	—	—	—	1	—	2	2	—	—	—	13
Aust. M'craft S. Pymble (1)	1	25	1	12	—	—	—	—	—	—	—	—	—	7
Aust. M'craft S. Pymble (2)	4	21	—	12	—	—	—	—	4	1	1	—	—	—
<i>Children's Homes</i>	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dalmar	2	4	1	1	—	—	—	—	—	—	—	1	—	3
Scarba	2	8	—	4	—	—	1	—	—	—	—	3	—	1
<i>Kindergartens</i>	—	—	—	—	—	—	—	—	—	—	—	—	—	—
L.G. C.C. Sydney	1	7	—	7	—	—	—	—	—	—	—	—	—	1
L.G. C.C. Melbourne	—	6	—	2	—	—	—	—	—	—	—	—	—	4
L.G. C.C. Adelaide	6	3	1	3	—	—	—	—	2	—	—	—	—	3
L.G. C.C. Perth	3	16	5	11	—	—	—	—	1	1	—	—	—	4
L.G. C.C. Hobart	3	12	—	4	—	—	—	—	1	1	—	—	—	9
Blue Bird	1	7	—	3	—	—	—	—	—	—	—	—	—	3
Woolloomooloo	1	8	—	3	—	—	—	—	—	—	—	—	—	4
Crusader	—	11	—	10	—	—	—	—	1	—	—	—	—	—
Parramatta	1	5	1	1	—	—	—	—	—	—	—	—	2	—

TABLE VIII.—(Continued).
DISSECTION OF ANSWERS TO QUESTIONS 7 AND 8.

Institution	Answers to Q. 8		METHODS OF TREATMENT RECORDED										Promotion of self interest, T. S. having caused sore on finger, etc.		No treatment recorded
			Purely obstructive, Splinting, aloes, nagging, etc.		Some obstruction (such as tight wrapping) plus feeding correction		Correction of feeding routine		Re-direction to some other activity		Use of dummy				
			Suc.	Fail.	Suc.	Fail.	Suc.	Fail.	Suc.	Fail.	Suc.	Fail.			
Newtown	—	2	—	—	—	—	—	—	—	—	—	—	—	—	2
Glebe—Marrickville	3	4	1	1	—	—	—	—	—	—	—	—	—	—	3
Cheltenham	1	11	1	7	—	—	—	—	—	—	—	—	—	—	3
Lance	—	2	—	2	—	—	—	—	—	—	—	—	—	—	—
Croydon	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—
Golden Fleece	1	7	—	1	—	—	—	—	—	—	—	—	—	—	—
Peter Pan	3	10	2	10	—	—	—	—	—	—	—	—	—	—	—
Waverley	3	7	—	7	—	—	—	—	—	—	—	—	—	—	—
Killara	1	2	—	2	—	—	—	—	—	—	—	—	—	—	—
Frances Newton	Nil	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Wickham	3	6	2	5	—	—	—	—	—	—	—	—	—	—	1
Harold Wheen	6	5	1	3	—	—	—	—	—	—	—	—	—	—	3
Leichhardt	Nil	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Surry Hills	—	2	—	2	—	—	—	—	—	—	—	—	—	—	—
Maybank	1	2	1	1	—	—	—	—	—	—	—	—	—	—	—
Samuel Cohen	—	1	—	1	—	—	—	—	—	—	—	—	—	—	—
Phoenix	—	2	—	—	—	—	—	—	—	—	—	—	—	—	2
Petersham Pre. School	—	2	—	1	—	—	—	—	—	—	—	—	—	—	1
Frank Saywell	3	22	—	4	—	—	—	—	—	—	—	—	—	—	20
East Chatswood	4	4	—	3	—	—	—	—	—	—	—	—	—	—	4
TOTALS	76	269	20	134	3	1	11	—	19	7	4	5	7	—	135

N.B. In certain cases figures do not cross check, because comments sometimes indicate answers in addition to those contained in Question 8.

METHODS OF FEEDING.

TABLE IX.

Thumb-suckers.

Total recordings	...	...	...	...	...	...	...	547
(1) Total number entirely breast-fed	...	...	...	...	...	...	...	245
Breast-feeders expressed as percentage of total	...	...	...	...	...	...	...	44.79%
(2) Total of those partly breast-fed and partly bottle-fed	...	...	...	...	...	...	...	136
Expressed as percentage of total	...	...	...	...	...	...	...	24.86%
(3) Total of those entirely bottle-fed	...	...	...	...	...	...	...	166
Expressed as percentage of total	...	...	...	...	...	...	...	30.35%
Total of (2) and (3)—those not entirely breast-fed	...	...	...	...	...	...	...	302
Expressed as percentage of total	...	...	...	...	...	...	...	55.21%

TABLE X.

Non-Thumb-Suckers.

Total recordings	...	...	...	...	...	...	...	1734
(1) Total number entirely breast-fed	...	...	...	...	...	...	...	884
Expressed as percentage of total non-thumb-suckers	...	...	...	...	...	...	...	50.98%
(2) Total number partly breast-fed and partly bottle-fed	...	...	...	...	...	...	...	373
Expressed as percentage of total	...	...	...	...	...	...	...	21.51%
(3) Total number entirely bottle-fed	...	...	...	...	...	...	...	477
Expressed as percentage of total	...	...	...	...	...	...	...	27.51%
Total of (2) and (3)—those not entirely breast-fed	...	...	...	...	...	...	...	850
Expressed as percentage of total	...	...	...	...	...	...	...	49.02%

TABLE XI.

Comparison of Normal and Disturbed Feeding.

	Total number of returns	Number of thumb- suckers	Per- centage of thumb- suckers
Carpenter Mothercraft Home	103	4	3.88
Tresillian, Petersham	153	58	37.91
Tresillian North			
Karitane, Woollahra			

TABLE XII.

Condensation of 45 Histories

Entirely breast-fed for at least six months or up to the age of taking history...	25
Partial or complete artificial feeding resorted to within one month of birth	8
Partial or complete artificial feeding resorted to within six months after birth	12
Number of histories recording discernible feeding disturbances within the first nine months	41
Number of histories recording over-rapid feeding from the breast and/or excessive milk supply	26
Number of histories recording over-rapid breast-feeding coupled with need for complement or weaning at six months or earlier	10
Successful attempts to correct thumb-sucking, using obstructive means—mittens, aloes, etc.	NIL
Unsuccessful attempts to correct thumb-sucking, using obstructive means—mittens, aloes, etc.	14
Successful use of dummy to correct thumb-sucking	NIL
Unsuccessful use of dummy to correct thumb-sucking	3
No attempts at correction made	28

CONCLUSIONS.

1. Evidence from dental literature establishes the fact that the practice of thumb-sucking in infants and children can, and very frequently does, cause extensive dental deformity. Not only is it potentially the direct cause of certain severe types of malocclusion, but it can also act as a contributing cause by giving rise to harmful secondary habits such as abnormal lip, cheek and tongue action.

2. Malocclusion not only interferes very considerably with the normal function of mastication, but the irregularity of the teeth also renders satisfactory oral hygiene extremely difficult and could predispose to a high caries incidence. Lack of normal functional stimulation could also adversely affect the gingival tissues.

3. Considerable attention has been paid to thumb-sucking by child psychologists, but a survey of literature on the subject points to a lack of understanding of the real nature of the act, why it occurs, and how it should be controlled.

4. My questionnaire investigation disclosed the following facts:—

Of 2326 children observed, 558 or 23.99% were persistent thumb-suckers.

Of 649 children aged six months or less, 153 or 23.57% were persistent thumb-suckers.

Of 347 recorded attempts at treatment, only 76 or 22.02% were successful.

211 forms described methods of treatment. 154 consisted of some form of obstruction and of these 154 attempts 134 were complete failures.

Of all children recorded as thumb-suckers, 44.79% were wholly breast-fed and 55.21% were partly or wholly artificially fed. Of children recorded as non-thumb-suckers 50.98% were wholly breast-fed and 49.02% were partly or wholly artificially fed.

5. Most of the methods of controlling the habit advocated by dentists are open to the severest criticism as likely to result in serious psychological harm and at the same time standing little or no chance of success in checking the habit. Statistical evidence is produced to support these claims.

6. The act of sucking in infancy is an instinctive act by means of which the intake of food is ensured. I have therefore called this act the sucking-feeding instinct.

7. Martin⁹ says "If the instinctive act fails in one direction, the organism attempts a variation of activity in its response." If there is a failure to satisfy the sucking-feeding instinct either at the breast or with the feeding bottle, the infant will attempt a variation by sucking something else and that will almost invariably be the conveniently placed thumb.

8. Thumb-sucking then nearly always starts because of incomplete satisfaction of the sucking-feeding instinct, and in over 90% of cases has its origin within the first nine months of life.

9. Strong support for this explanation of thumb-sucking is provided by the behaviour of bucket-fed calves as distinct from calves fed by their dams, by nurse cows, or by the nipple-feeding device. Bucket-fed calves invariably indulge in substitute sucking of each other, whereas naturally-fed calves never do so, nor do those which have been established in a satisfactory routine at the nipple-feeding device.

10. Further support is seen in the fact that a high percentage (37.9%) of the babies admitted to Tresillian and Karitane Mothercraft Training Schools because of feeding difficulties are thumb-suckers, whilst of the normal healthy babies admitted to Carpenter Convalescent Home the percentage is extremely small (3.88%).

The 45 Case Histories obtained from various Child Clinics provide further support for this contention.

11. Correction of thumb-sucking as soon as it appears is of great importance, because it will not then develop the characteristics of a habit. Careful correction of every detail of the feeding routine should be carried out at once and particular attention should be paid to regulating the flow of milk from breast or feeding-bottle, so as to ensure adequate sucking as well as nutritional and emotional satisfaction.

My statistics disclose the fact that 23.57% of all children aged six months or less are thumb-suckers, and this indicates the need for further careful research into the whole technique of infant feeding. Often the most subtle disturbance of the feeding routine will cause incomplete satisfaction of the sucking-feeding instinct and will result in thumb-sucking.

12. Weaning is recognised as an extremely important phase through which the infant must pass. Great care must be exercised to ensure that every detail of weaning technique is perfected.

13. Failure to guide the infant successfully through this transition stage will often result in some purely infantile practice such as thumb-sucking, which should have been left behind, being carried over into the next stage of development.

14. Thumb-sucking occasionally starts in the post-weaning period. Usually it is then an attempt to regress to the infantile state in search of security because of some emotional disturbance.

15. Sucking-feeding in the mother's arms is strongly associated with feelings of security, comfort and protection. Thumb-sucking promotes similar feelings but they are not real and the situation becomes a fantasy. Thumb-sucking thus promotes a fantasy situation into which the child can retreat from realities.

16. Treatment of thumb-sucking in the past has consisted almost entirely of using different forms of obstruction. Such methods are contrary to accepted psychological principles, seldom meet with any success, and cause considerable psychological disturbance. Evidence is produced of the complete failure of obstructive methods of treatment.

17. Proper treatment in the pre-weaning period is to correct the feeding routine, and to assist in an easy transition from sucking activity to chewing activity. After weaning, the correct principle of treatment is the re-direction of the energy behind the habit into some other allied activity which is of a more desirable nature.

18. Thumb-sucking involves no moral issues.

19. Parent education is essential for successful treatment.

20. Thumb-sucking is fundamentally a psychological problem which frequently gives rise to serious physical defects. Action towards prevention and control of these defects must first of all recognise and conform to established psychological principles.

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Australian Mothercraft Society.

Carpenter Mothercraft Home.

Department of Agriculture, Division of Dairying, N.S.W.

The Kindergarten Union of N.S.W.

King George V Memorial Hospital.

The Lady Gowrie Child Centres.

The McGarvie Smith Animal Husbandry Farm, Faculty of Veterinary Science, University of Sydney.

Tresillian Mothercraft Training Schools at Willoughby (North) and Petersham.

The United Dental Hospital.

Royal Hospital for Women.

Crown Street Women's Hospital.

Dalmar Children's Home.

Scarba Welfare House for Children.

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The
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EDITORIAL DEPARTMENT

A MONTH TO REMEMBER

August 1950 will long remain in the memories of those members who attend Congress as having a tremendous impact on the history of dentistry in Australia.

In order to advise those who have already completed details of their registration, we publish herewith a review of the Congress programme which lists every lecture and table clinic set down.

Those who have not already made arrangements for Congress will certainly want to do so when they read the tremendous range of the subject matter to be presented.

From some one hundred and twenty lectures and sixty-five table clinics, there will be ample opportunity for all requirements to be met, whether for those whose practice is directed into special channels, or for the general practitioner who has a special interest, or for the broad fields of general practice.

Research workers will find many items of interest for them in their own fields, with contributions presented from not only local sources but eminent authorities from overseas.

The important field of Preventive Dentistry has received special attention and the Congress proceedings will open on a major theme with a Plenary Session on Dental Caries.

This Plenary Session will present factual data on the problems associated with the cause and prevention of dental caries, designed primarily for the information of the general practitioner—it is not designed for the specialist or research worker.

The session will take the form of short lectures with discussions between the speakers and therefore will not be comparable to a formal lecture but will have all the merits and advantages of a round table discussion.

The venue of the Plenary Session is to be the Wallace Theatre at the University of Sydney and for those who do not wish to attend there will be the Dental Exhibition—Trade Exhibit, Scientific Exhibit, Dental Health Exhibit—at the Lower Town Hall, George Street, Sydney, where a continuous Film Session will be in progress.

The table clinic sessions alone with sixty-five individual contributions will come as a high climax for the terminal session of Congress, for they are to be held at the United Dental Hospital on Friday afternoon.

In addition to this truly huge programme, the Social Activities are being organised on a comparable scale, and the Chairmen of the Entertainment, Sports, Social and Ladies Committees are to be complimented on the intense activity with which their programmes have been developed and on the broad planning which has been done to provide for all.

News and Notes

CONGRESS REVIEW

Hereunder is a comprehensive list of the lectures and clinics which will be given during the Twelfth Australian Dental Congress from Monday, 21st August, to Friday, 25th August. It is hoped that this information will be of some assistance to those who wish to attend lectures in specialised fields, and make the decision to attend irresistible.

LECTURES AND CLINICS.

Monday, 21st August:

Plenary Session.

The Cause and Prevention of Dental Caries:

Introduction: J. V. Hall Best, B.D.S. (Syd.), D.M.D. (Harv.), F.D.S., R.C.S. (Eng.), F.A.C.D.

Aetiology and clinical aspects of caries and its treatment: Robert Harris, M.D.S. (Syd.).

Bacteriological problems of dental caries: N. E. Goldsworthy, M.B., B.S. (Syd.), Ph.D. (Cantab.), D.P.H., D.T.M. & H.

Nutritional aspects of the problems of dental caries: C. D. Hearman, D.D.Sc. (Melb.).

Evaluation of existing projects and a correlation of the material presented by the previous speakers: R. G. Ellis, B.D.Sc. (Adel.), D.D.S., M.Sc. (Dent.), F.D.S., R.C.S. (Eng.).

Correlation of discussion and expression of thanks: A. J. Arnott, D.D.Sc. (Syd.), F.D.S., R.C.S. (Eng.), F.A.C.D., F.I.C.D.

Oral Surgery and Anaesthesia.

Tuesday, 22nd August:

Surgery clinic: S. Scougall, M.B., Ch.M.; G. S. Colvin, M.B., B.S., M.Ch. Orth. General anaesthesia: W. Keller, M.B., M.S., D.A.

Oral surgery clinic: F. Carberry.

General anaesthesia: H. J. Daly, M.D., Ch.M., F.R.A.C.P., F.R.A.C.S.

Post-operative treatment and complications in relation to oral surgical procedure: H. R. Kemp, D.D.Sc. (Syd.).

Modern surgical methods in the treatment of trigeminal neuralgia: G. Phillips, M.S., M.Sc., F.R.A.C.S.

The surgical solution to some full denture problems: G. Christensen, B.D.Sc. (Q.), D.D.S. (Tor.).

Regional anaesthesia clinic: H. R. Kemp, D.D.Sc. (Syd.).

Oral surgery clinic: C. H. Ritchie, B.D.S. (Syd.).

Regional anaesthesia clinic: C. C. Croker, B.D.S. (Syd.).

Oral surgery clinic: T. R. Corbett, M.D.S. (Syd.).

Wednesday, 23rd August:

- Oral surgery clinic: K. K. Stringer, M.D.S. (Syd.).
General anaesthesia clinic: W. I. T. Hotton, M.B., Ch.M., D.A. (Eng.), F.R.A.C.P., D.A., F.S.A.R.C.S.
Diagnosis, treatment planning and post-operative clinic: A. J. Arnott, D.D.Sc. (Syd.), F.D.S., R.C.S., F.R.C.D., F.I.C.D.
Oral surgery clinic: H. R. Kemp, D.D.Sc. (Syd.).
Regional anaesthesia clinic: C. H. Ritchie, B.D.S. (Syd.).
Swellings of the face: M. R. Flynn, B.A., M.D., Ch.M., B.Sc.
Pathological and bacteriological examinations relative to oral surgery: D. A. Cameron, M.D.S. (Syd.).
The use of hand-cutting instruments clinic: P. Clipsham, D.D.S. (Penn.).
The surgical treatment of extensive cysts of the maxillae: E. R. Magnus, D.D.Sc. (Syd.).
Radiology as applied to dental surgery: F. McEncroe, M.B., Ch.M., D.R.
Surgical approach to immediate dentures: F. E. Helmore, D.D.Sc. (Syd.); C. H. Graham, M.D.S. (Syd.), D.D.S. (N.U.).
Regional anaesthesia maxillary injection: C. H. Ritchie, B.D.S. (Syd.).
Regional anaesthesia and oral surgery clinic: Miss N. F. Corda, B.D.S. (Syd.); A. Campbell, B.D.S. (Syd.).

Friday, 25th August:

- Surgery clinic: K. W. Starr, O.B.E., M.B., M.S., F.R.C.S., F.A.C.S., F.R.A.C.S.
General anaesthesia: J. McCulloch, M.B., M.R.A.C.P., D.A.
Oral surgery clinic: R. V. Curtin, B.D.S. (Syd.).
General anaesthesia: L. T. Shea, M.B., B.S., D.A.
Post-operative respiratory infection: G. Kaye, M.D., B.S., D.A.

Prosthodontia.

Tuesday, 22nd August:

- Diagnosis in partial denture construction and its effect on design of partial dentures—Part I: J. H. Wilson, D.D.Sc. (Syd.). Part II: L. S. Beckett, M.D.S. (Syd.).
Physiological consideration for the vertical and horizontal positions of the mandible: J. R. Thompson, D.D.S. (Chicago).
The relative merits of porcelain and acrylic teeth: A. R. Docking, M.Sc. (Melb.).
A precision technique that produces dentures which fit and function: W. H. Terrell, D.D.S., F.A.C.D.

Wednesday, 23rd August:

- Functional anatomy of the temporomandibular articulation: H. Sicher, M.D.
The fundamental principles involved in partial denture design: V. L. Steffel, D.D.S., F.A.C.D. Read by W. H. Terrell, D.D.S., F.A.C.D.
Specialised frictional attachments and their role in partial denture construction: W. H. Terrell, D.D.S., F.A.C.D.
Balanced occlusion—a discussion on certain of its important aspects: F. Trebitsch, B.D.S. (Syd.).
The pathway to success: C. H. Bliss, D.D.S., F.A.C.D. A tape recording presented by W. H. Terrell, D.D.S., F.A.C.D.
Immediate restoration for complete dentures: W. H. Terrell, D.D.S., F.A.C.D.

Friday, 25th August:

- Hydrocolloid impression materials and an evaluation of their properties for impressions for partial dentures: K. P. Mackinnon, M.D.S. (Syd.).
Simplification of balanced occlusion by the use of new posterior tooth forms: A. J. Hoole, L.D.Q., B.D.Sc. (Q.).
Aesthetics and phonetics in prosthetics: E. Pound, D.D.S. Read by W. H. Terrell, D.D.S., F.A.C.D.
Relines, rebases or transfers and repairs: W. H. Terrell, D.D.S., F.A.C.D.

Operative Dentistry.

Tuesday, 22nd August:

- Intra-osseous anaesthesia for anterior and bicuspid teeth: R. M. Kirkpatrick, D.D.Sc. (Syd.).
Self-curing resins: R. N. McMullin, B.D.S. (Melb.), D.D.S. (N.U.).
Root canal therapy: J. Lyell, B.D.S. (Syd.).
Acrylic restorations: E. Gee, M.D.S. (Syd.).
The use of hydrocolloid and stone die techniques: E. H. Bastian, M.D.S. (Syd.), D.D.S. (N.U.).
Aesthetic requirements in restorative dentistry: R. W. Wright, M.D.S. (Syd.).

Wednesday, 23rd August:

Special tape recordings on the subject of the economics of dental practice:

Presented by W. H. Terrell, D.D.S., F.A.C.D.

Some useful cavity preparations for gold inlays in anterior teeth: W. M. Jones, B.D.S. (Syd.).

The properties and use of some restorative materials: A. R. Docking, M.Sc., A.A.C.I.

Friday, 25th August:

The problem of fractured upper bicuspid teeth: S. M. Hicks, B.D.S. (Syd.), D.D.S. (N.U.).

Pedodontia.

Tuesday, 22nd August:

Traumatic injuries to the teeth of children: Professor R. G. Ellis, B.D.S. (Adel.), D.D.S., M.Sc. (Dent.), Toronto.

Some aspects of pedodontia: B. Kruger, B.D.Sc. (Q.).

Treatment of child patients in general practice: W. D. Suthers, B.D.S. (Syd.), D.D.S. (Tor.).

Wednesday, 23rd August:

What parents want to know. Questions and answers: Miss S. Hull, B.D.S. (Syd.).

Some fallacies concerning children's dentistry: T. B. Lindsay, M.D.S. (Adel.).

Some aspects of pedodontia relative to orthodontia: A. S. Burgess, M.D.S. (Syd.).

Amalgam restorations in deciduous teeth: O. Basil Jones, B.D.S. (Syd.), D.D.S. (Tor.).

Management of children in the dental surgery: Miss D. Musgrave, B.D.S. (Syd.).

Friday, 25th August:

Conservation of teeth with exposed pulps in children: J. Reich, M.D.Sc. (Melb.).

Secondary dentine formation in deciduous teeth: N. D. Martin, M.D.S. (Syd.).

Crown and Bridgework.

Tuesday, 22nd August:

Modified Richmond crown: K. G. Lowry, B.D.S. (Syd.).

Outline of fixed bridgework: N. W. Kestel, M.D.S. (Syd.).

Wednesday, 23rd August:

One-piece castings for fixed bridgework from injection hydrocolloid impression:

T. E. Gibson, B.D.Sc. (Q.), D.D.S. (Minn.).

Friday, 25th August:

Plastic dowell crown: R. L. Gabriel, B.D.S. (Syd.).

Fixed bridge development from a hydrocolloid injection impression technique:

R. N. McMullin, B.D.Sc. (Melb.), D.D.S. (N.U.).

Ceramics.

Tuesday, 22nd August:

Science, art and ceramic technique fundamentals involved in porcelain jacket crown prosthesis: A. O. Klaffenbach, D.D.S.

The problem of aesthetics in our restorative procedures: W. D. Vehe, D.D.S.

Wednesday, 23rd August:

Porcelain jacket crown technique: W. A. Grainger, M.D.S. (Syd.).

Simplifying the construction of the porcelain veneer: J. R. Gill, D.D.S. (Minn.).

Complete mouth rehabilitation: H. Kazis, D.M.D. (Harvard).

Friday, 25th August:

Self-curing resins: P. R. Rheuben, D.D.S. (Minn.).

Periodontia.

Tuesday, 22nd August:

Progressive stages in the treatment of chronic periodontal disease of local origin:

R. Thompson, B.D.S. (Syd.).

The use of acrylic splints and veneers in periodontal surgery: R. M. Cloutier,

B.D.S. (Syd.), D.D.S. (Tor.).

Vincent's infection: R. Krauss.

The pink tooth-brush: R. G. Willoughby, B.D.S. (Adel.).

Wednesday, 23rd August:

Systemic aetiological factors in periodontoclasia: A. G. Hunter, M.D.S. (Syd.).

Friday, 25th August:

The diagnosis of periodontal lesions: P. Benbow, B.D.S. (Syd.).

Radiography in periodontia: T. Pyke, B.D.S. (Syd.).

Orthodontics.

Tuesday, 22nd August:

- Orthodontic interest for the general practitioner: H. Chapman, L.D.S. (Eng.).
- The problem of impacted teeth in orthontia: K. T. Adamson, D.D.Sc. (Melb.).
- The timing of extractions in orthodontic treatment: R. W. Gates.
- Mandibular anchorage development in relation to intermaxillary movement: A. J. Cunliffe, M.D.S. (Syd.).
- The application of oral screens to the mechano-therapy of maxillary protrusion: A. T. Taylor, D.D.Sc. (Syd.).
- Rapid fabrication of orthodontic retainers: R. Y. Norton, M.D.S. (Syd.).

Wednesday, 23rd August:

- Myofunctional therapy as an adjunct to orthodontic treatment: V. P. Webb, B.D.Sc. (Q.), D.D.S., Dip. Orth. (Tor.).
- The nature of facial prognathism and its application to the analysis of malocclusion: Arne Bjork, Odont., Dr.
- The examination of the patient: T. Seward, B.D.Sc. (Melb.), D.D.S. (Penn.).
- A method of treating protrusion of the upper arch in Class II, Div. I (Angle) malocclusion: B. L. Rosenstengel, D.D.S. (Penn.).
- Acrylic bite plane: V. P. Webb, B.D.Sc. (Q.), D.D.S., Dip. Orth. (Tor.).
- A method of making round tubes and adjustable bands and a means of moving a tooth in various directions: B. L. Rosenstengel, D.D.S. (Penn.).
- A mechanical plastic mixer: A. T. Taylor, D.D.Sc. (Syd.).
- Ideal arch design on an atomic basis: D. H. Jenkins, B.D.Sc. (Q.), D.D.S.

Friday, 25th August:

- Undergraduate orthodontic instruction: R. A. Campbell, B.D.Sc. (Melb.).
- The treatment of bimaxillary protrusion: D. F. Spring, D.D.Sc. (Melb.).
- The orthodontic future of the eight-year-old child: D. H. Jenkins, B.D.Sc. (Q.), D.D.S.

Research.

Tuesday, 22nd August:

- Design for observations and experiments: Helen N. Turner, B.Arch. (Syd.).
- The morbid histology and physiology of carious lesions: C. B. Maddern, D.D.Sc. (Adel.).
- Some aspects of the masticatory mechanism with particular reference to the temporo-mandibular joint: J. P. Walsh, M.B., B.S., B.D.Sc. (Melb.), F.D.S., R.C.S. (Eng.).
- Mucins and mucoids in relation to dental problems: K. W. Knox, B.Sc. (Syd.).

Wednesday, 23rd August:

- The solubility of salts and its application to the problem of dental caries: L. O. Martin, B.Sc. (Syd.), A.A.C.I.
- Mechanism of recent methods of caries control: H. M. Leicester, Ph.D.

Friday, 25th August:

- Tissue reaction to fibrin: H. G. Radden, D.D.Sc. (Melb.), F.D.S., R.C.S. (Eng.).
- Pattern of caries in relation to the pattern of soil fertility: W. A. Albrecht, Ph.D.

Preventive Dentistry.

Tuesday, 22nd August:

- Aspects of dental health activities in Norway: Professor Guttorm Toverud.
- Topical treatments of the teeth as a means of preventing dental decay: Basil Bibby, D.M.D. (Harvard).
- Dental caries: Professor Bernard Gottlieb*, H. M. Crawford and H. B. Younger.
- Preventive periodontia—a necessary corollary to caries control: R. Tompson, B.D.S. (Syd.).

Wednesday, 23rd August:

- The present conception of the aetiology and histopathology of dental caries: C. D. Hearman, D.D.Sc. (Melb.).
- Practical measures for the control of dental caries: N. D. Martin, M.D.S. (Syd.).
- Caries and sugar: G. L. Hurburgh, B.D.Sc. (Melb.), D.D.S.
- Is preventive orthodontia a practical proposition?: K. T. Adamson, D.D.Sc. (Melb.).
- Infant feeding relative to the incidence of dental caries: E. F. Marks, B.D.Sc. (Melb.).

Friday, 25th August:

- The control of dental caries by dietary means: D. A. Cameron, M.D.S. (Syd.).
- Understanding the child patient: Miss Zoe Benjamin.
- Some theoretical considerations of dental caries: L. S. Fosdick, Ph.D.

*Deceased.

Pathology and Bacteriology.

Tuesday, 22nd August:

A report of two cases of adamantinoma: D. A. Cameron, M.D.S. (Syd.).

Wednesday, 23rd August:

The defence mechanisms of the dental pulp and its clinical significance: E. B. Manley, M.Sc., M.D.S., F.D.S., R.C.S. (Eng.).

Some oral tumours: Jean Armytage, M.B., B.S., M.R.A.C.P.

Ammonia and inorganic phosphorous content of the saliva in relation to dental caries and diet: M. Evans, D.D.Sc. (Adel.).

The female sex hormones and their relation to some oral conditions: F. G. Christensen, B.D.Sc. (Q.), D.D.S. (Tor.).

Friday, 25th August:

Histopathology of the filiform papillae of the tongue: R. G. Morris, D.D.Sc. (Melb.).

Dental Health.

Tuesday, 22nd August:

Patient education in oral hygiene—an unexplored avenue for continuity of practice: A. W. Rourke, B.D.S. (Syd.), D.D.S. (Tor.).

Intelligent answers to our patients' questions: K. Skues, D.D.Sc. (Melb.).

Wednesday, 23rd August:

Why public dental education?: R. M. Gillies, B.D.Sc. (Melb.), D.D.S. (Penn.).

Friday, 25th August:

Planning the programme for dental health education: J. E. Holliday.

Dental Services.

Tuesday, 22nd August:

A discussion on aspects of dentistry in the services: Lieut.-Colonel J. W. Skinner.

Wednesday, 23rd August:

An appreciation of men and events in the Royal Australian Army Dental Corps, 1939-1950: Major M. M. Sullivan.

TABLE CLINICS.

Friday, 25th August.

Oral Surgery.

Prosthetic appliances used for the treatment of fractured jaws: J. S. Hill, B.D.S. (Syd.), D.D.S. (N.U.).

Improved hand-cutting instruments: P. Clipsham, D.D.S. (Penn.).

Haemorrhage: C. C. Croker, B.D.S. (Syd.).

Sterilization of instruments and material: T. R. Corbett, M.D.S. (Syd.).

Lesion of the oral cavity: P. Benbow, B.D.S. (Syd.).

Immediate root therapy and apical surgery: F. E. Helmore, D.D.Sc. (Syd.).

A trend in the treatment of some fractures of the edentulous mandible: H. R. Cash, B.D.Sc. (Melb.), D.D.S. (N.U.); M. Renou, F.R.C.S., F.R.A.C.S.; W. A. Dott, D.D.Sc. (Melb.).

Prosthodontia.

Essentials of the impression technique and surveying in partial denture prosthesis: B. J. Carolan, B.D.S. (Syd.), D.D.S. (N.U.).

Reinforced skeleton dentures: P. J. Hooton, B.D.S. (Syd.).

Practical application of stress breaking in partial dentures: R. P. Lane, B.D.S. (Syd.), D.D.S. (Penn.).

Full dentures simplified by use of acrylic teeth: G. V. Gengos, B.D.S. (Syd.), D.D.S. (Tor.).

An evaluation of accepted full denture impression techniques: L. C. Keyte, B.D.S. (Syd.).

Pound's principles of aesthetics and phonetics: G. Lonsdale.

Standard procedures in the setting up of teeth: C. H. Graham, B.D.S. (Syd.), D.D.S. (N.U.).

Why use balanced occlusion? Periodontia and partial denture prosthesis: H. Assheton-Chin, B.D.S. (Syd.), D.M.D. (Harvard).

Immediate denture service: R. L. Taylor, M.D.S. (Syd.).

Balanced occlusion—a prophylactic and therapeutic goal: F. Trebitsch, B.D.S. (Syd.).

Simplifying balanced occlusion by using a new posterior tooth: A. J. Hoole, L.D.Q., B.D.Sc. (Q.).

Chrome cobalt alloys: A. R. Docking, M.Sc. (Melb.), A.A.C.I.

- Pitfalls in the use of acrylic resins and suggested remedies: K. P. Mackinnon, M.D.S. (Syd.).
Dentist-mechanic co-operation: A. W. Rourke, B.D.S. (Syd.), D.D.S. (Tor.).
Vacuum casting: R. McMullin, B.D.Sc. (Melb.), D.D.S. (N.U.).
The immediate treatment of cleft palate babies: W. J. Wearn, D.D.Sc. (Syd.), D.M.D. (Harvard).
Prosthetic restoration for war and civil injuries to intra-oral tissues: E. Gee, M.D.S. (Syd.).
Prosthetic appliances used for the treatment of fractured jaws: J. S. Hill, B.D.S. (Syd.), D.D.S. (N.U.).
Cosmetic prosthetic appliances: R. K. Miles, B.D.S. (Syd.).

Operative Dentistry.

- Hydrocolloid impression technique for inlay construction: A. W. Bull, B.D.S. (Syd.), D.D.S. (N.U.).
Inlay cavity preparation: B. G. Allcock, M.D.S. (Syd.).
Silicate cements: B. Smith, B.D.S. (Syd.), D.D.S. (Tor.).
Hydrocolloid and stone die technique: E. Bastian, M.D.S. (Syd.), D.D.S. (N.U.).
Trays for indirect inlays: G. A. de Denta, B.D.Sc. (Q.).
Vacuum investing and hygroscopic expansion: K. H. Caisley, B.D.S. (Syd.).
Electro-forming indirect inlay technique: N. D. Martin, M.D.S. (Syd.).
Your cavities in half the time. (Cavity preparation under water and under compressed air and water.): Dowell Wade, B.D.S. (Syd.).

Pedodontia.

- Cavity preparation in deciduous teeth: O. Basil Jones, B.D.S. (Syd.), D.D.S. (Tor.).
Pulpotomy: J. Reich, M.D.Sc. (Melb.).
Full and partial dentures for children: Adele Ruhle, B.D.S. (Syd.).
Simple space maintainers: W. D. Suthers, B.D.S. (Syd.), D.D.S. (N.U.).
Indirect inlay techniques for child patients: J. E. McGovern, B.D.S. (Syd.), D.D.S. (Tor.); D. J. Oddy, B.D.S. (Syd.), D.D.S. (Tor.).

Crown and Bridgework.

- Fixed bridgework: E. McDermott, B.D.S. (Syd.), D.D.S. (N.U.).
Plastic pontics in fixed bridgework: B. Smith, B.D.S. (Syd.), D.D.S. (N.U.).

Ceramics.

- Mouth reconstruction with emphasis on ceramics: W. A. Grainger, M.D.S. (Syd.).
Various uses for the porcelain furnace: S. M. Hicks, B.D.S. (Syd.), D.D.S. (N.U.).
Pontics: N. W. Kestel, M.D.S. (Syd.).
Simplification of techniques in model-making: A. W. Rourke, B.D.S. (Syd.), D.D.S. (Tor.).
Porcelain inlays: A. Glen, D.D.S. (Cal.).
Examples of porcelain restoration: E. E. La Frierier, D.D.S.

Periodontia.

- Therapeutics in periodontia: R. L. Currie, M.D.S. (Syd.).
Why balanced occlusion? Periodontia and partial denture prosthetics: H. Assheton-Chin, B.D.S. (Syd.), D.M.D. (Harvard).

Orthodontia.

- Oral screens in active treatment. Mechanical mixing of plaster: A. Thornton Taylor, D.D.Sc. (Syd.).
Rapidly fabricated retainers. Tooth positioner. Various auxiliaries used with fixed appliances: R. Y. Norton, M.D.S. (Syd.).
Mandibular anchorage: A. J. Cunliffe, M.D.S. (Syd.).
Acrylic bite planes: V. P. Webb, B.D.Sc. (Q.), D.D.S., Dip. Orth. (Tor.).
Fabrication of adjustable bands and round tubes. Technique of various tooth movements: B. L. Rosenstengel, D.D.S. (Penn.).
Anatomical arch design: D. H. Jenkins, B.D.Sc. (Q.), D.D.S.
Different bite depths in eight-year-old twins: R. W. Halliday, B.D.S. (Syd.), D.D.S. (Tor.).
Use of a removable arch for maxillary retraction: R. G. Henry, M.D.S. (Syd.).
Simple fixed appliances: R. McGrath, M.D.S. (Syd.).
Various set-ups of the edgewise mechanism. Johnson twin-arch appliance: K. T. Adamson, D.D.Sc. (Melb.).

An improved form of wing appliance: E. Storey, B.D.Sc. (Melb.).
A simple lingual appliance for increasing lateral growth of the mandible during active growth periods: A. G. Parker, B.D.Sc. (Melb.).

SILENT CLINIC.

Prosthodontia: L. S. Beckett, M.D.S. (Syd.).
Orthodontia: Contributed by the lecturers and clinicians of the Orthodontic Section.

Operative Dentistry.

Cavity preparation: J. Sagar, B.D.Sc. (Q.), D.D.S. (Tor.).

UNIVERSITY OF OTAGO, DUNEDIN, N.Z. CHAIR IN CONSERVATIVE DENTISTRY

Applications are invited for this Chair. The Professor will have charge of the Conservative Department of the National Dental School.

The appointment is a full time one; salary £1,500-£1,800.

Full information is available from the undersigned, or from the Registrars of other Universities in New Zealand or Australia.

Applications to be sent to the Secretary, Association of Universities of the British Commonwealth, 5 Gordon Square, London, W.C.1., before 31st August, 1950; duplicate copy to be sent to the undersigned. *J. W. Hayward, Registrar.*

DENTAL JOURNALS REQUIRED

Owners of a set of the "Dental Journal of Australia" from 1929 onwards are requested to communicate with the undermentioned Dutch Booksellers, with a view to a possible sale. The journals are required for a medical library, and offers should be addressed to Messrs. Swets & Zeitlinger, Boekhandel en Uitgevers, Keizersgracht 471 and 487, Amsterdam, Holland, who are handling the matter on behalf of their library-client.

SOUTHERN DIVISION

On Saturday and Sunday, 29th and 30th April, a most successful meeting of members of the Southern Division took place in Wagga. Welcome visitors to the city included four members of the Victorian Post-Graduate Committee—Dr. K. T. Adamson, Dr. Roy Cash, Messrs. Ron Newbury and R. N. Peverill, together with Mr. F. T. Herbert, Dental Secretary of the Australian Dental Association (Victorian Branch). The Division was also honoured by the presence at the meeting of Dr. E. R. Magnus, President of the New South Wales Branch of the Australian Dental Association. Thirty-three members of the Southern Division were present, including representatives from Albury, Narrandera, Cootamundra, Lockhart, Young, Deniliquin, Leeton, Tumut, Gundagai, Temora, Corowa, Berrigan, Allonville and Harden.

The dentists attending assembled on Saturday at 10 a.m. at the City Council Chambers, where a reception was held, presided over by the Mayor, Alderman H. E. Gissing.

By the courtesy of the Principal of the Wagga Teachers' College, the lectures over the two days were delivered at the College, these being entitled:—

Orthodontia for the general practitioner—Dr. K. T. Adamson.

Pre-operative use of penicillin—What to do with the tooth that fractures when attempting to extract it—Dr. H. Roy Cash.

The preparation of the mucous membrane prior to surgery—Mr. C. R. Newbury.

Practice management—Mr. R. N. Peverill.

On Saturday evening, a cocktail party was held at the home of Mr. and Mrs. W. P. Riordan. The opportunity was taken to present Mr. Riordan, President of the Southern Division with a Ronson table lighter on behalf of the Division as a token of appreciation for his 11 years' untiring service as President.

Dinner at Romano's Hotel followed the cocktail party.

Sunday morning was devoted to golf and bowls, and luncheon was served at the Country Club, at the invitation of its President, Dr. L. A. Moxham.

A buffet tea at the home of Mr. and Mrs. Gordon M. Cox was the finale to a most interesting and enjoyable meeting.

Association Activities

AUSTRALIAN DENTAL ASSOCIATION

Extract from the Minutes of the Meeting of the Federal Executive held in Melbourne on Sunday, 7th May, 1950, at 11 am.

Present: The President, Dr. W. Stanley Wilkinson, in the chair; Dr. J. V. Hall Best, Dr. J. S. Baird, Mr. R. N. Peverill, and the Honorary Secretary, Dr. Gershon Bennett.

The President, on behalf of the Executive, conveyed felicitations to the Vice-President, Dr. J. V. Hall Best, on his admission as a Fellow in Dental Surgery, Royal College of Surgeons, England.

The Vice-President, Dr. J. V. Hall Best, welcomed the President and conveyed the pleasure of the Executive on his recovery after an operation.

Minutes: It was resolved that the minutes of the previous meeting held on 17th October, 1949, be confirmed.

Business Arising from Minutes:

National Health and Medical Research Council—Sub-committee for Report on Dental Caries Control: The meeting was advised that Mr. H. R. Sullivan (N.S.W.), Dr. C. D. Hearman (Vic.), and Dr. J. A. Sagar (Qld.) had accepted membership of the abovementioned Sub-committee.

A letter dated 11th April, 1950, was received from Mr. H. R. Sullivan, Convenor of the Sub-committee, requesting elucidation as to the form which the Sub-committee's report should take. In reply, regret was expressed at the fact the Sub-committee had not been fully informed of the work it was desired that they should undertake and an extract was quoted from the report by the A.D.A. representative (the Federal President) to the Australian Dental Association on the 26th Session of the National Health and Medical Research Council, reading as follows:—

"Arising out of a discussion on the necessity of according absolute priority to the prevention aspects of any attack on dental disease, it was decided to ask the Australian Dental Association to supply the Council with written matter which might serve as the basis of an educational campaign. The Council was informed by me, on behalf of the Association, that an expert Committee would be set up to do this, and that its report would be available for the next meeting."

Correspondence:

National Dental Health: After discussion between members of the Executive it was resolved that the President should write to the Minister for Health stating that, in view of the fact that the Annual Meeting of the Association occurs in August next, he would like to have some indication of Governmental policy in regard to National Dental Health for submission to that meeting.

A letter, dated 3rd January, 1950, from the Victorian Branch, was tabled in which that Branch gave notice of its intention to submit the following motion at the next meeting of the Federal Council:—

"That 'Grant-in-aid', as previously outlined by the Victorian Branch, be incorporated in any future policy of the Association in order to provide treatment for the children of parents who seek the services of private practitioners."

It was resolved that copies of this letter be forwarded to State Branches.

A telegram, dated 20th December, 1949, from the Director-General of Health was tabled, with reference to proposed conference with the Minister for Health. As a result of this, a letter was sent to the State Branches on 22nd December, 1949, which was approved by the meeting. Replies were received from all Branches and tabled.

A letter from the New South Wales Branch, dated 7th February, 1950, was acknowledged, in which were enclosed copies of a statement issued by that Branch as an expression of its opinion on a National Dental Health Service. At the request of this Branch, the copies were distributed to the other Branches. Our reply, dated 20th February, 1950, was approved.

Our letter to State Branches, dated 16th November, 1949, was approved, in which comments on the Goodes Report were requested. Such comments, when received, were distributed to other State Branches for information.

Our letter to the N.S.W. Branch, dated 16th November, 1949, was approved, requesting that the thanks of the Working Party on the Goodes Report be conveyed to Mr. Robert Harris for his invaluable assistance in compiling the Report.

National Health and Medical Research Council: A letter, dated 3rd April, 1950, from the National Health and Medical Research Council with reference to the appointment of Dr. G. J. Cummins as a member of the Industrial Hygiene Committee of the Council was tabled. Our reply, dated 6th April, 1950, concurring in Dr. Cummins' appointment, was approved.

Fulbright Agreement: A letter to the Secretary, Department of External Affairs, dated 24th March, 1950, stating that several of our members are interested in the provisions of the Fulbright Agreement, as they intend shortly to proceed to the U.S.A. for post-graduate studies, was approved. A reply, dated 28th March, 1950, was received, advising that enquiries regarding the Fulbright Agreement may be addressed to the Chairman of the Board of Directors, U.S. Educational Foundation in Australia, C/o. American Embassy, Canberra.

Amendments to the Constitution: It was resolved that various letters received from the State Branches with reference to amendments to the Constitution be circulated to all Branches, with the request that they furnish the Federal Office with any further proposed amendments within seven days. It was resolved also that our covering letter should suggest that a round-table conference be held at the expense of the State Branches with the object of enabling amendments, which will have a good prospect of being passed, to be submitted to a Special Meeting.

On the recommendation of the President, it was resolved that at the next election of office-bearers, nominations for each office in turn will be called for by the President, and each nomination for that office will be dealt with in accordance with Section 5 of the Constitution in the order in which it is received.

Official functions at Congress: A letter, dated 18th November, 1949, to State Branches, was approved suggesting that official evening entertainments at Congress be as few as possible, so as to allow advantage to be taken of the academic side of Congress. Replies from the Victorian and Tasmanian Branches, dated 13th December and 19th December, 1949, respectively, were tabled.

Standards Committee: A letter to the Chairman of the Standards Committee, dated 24th November, 1949, giving details of resolutions passed at the Annual Meeting, October 17, 1949, was approved. The reply, dated 7th December, 1949, enclosing minutes of meeting of Standards Committee held on 25th November, 1949, was tabled.

A letter, dated 28th February, 1950, from the Chairman of the Standards Committee, advising the Federal Office of recent developments in the work of the Committee, was tabled. This letter also requested a further grant of £10 towards the administrative expenses of the Committee. Our reply, dated 3rd March, 1950, was approved. It was resolved that the payment of the sum of £10 towards the administrative expenses of the Standards Committee be authorised.

A letter, dated 21st March, 1950, from the Chairman of the Standards Committee was tabled, enclosing copies of the minutes of the meeting of the Standards Committee held on 8th March, 1950, and also copies of the Australian Standard Specifications Nos. T1, T2, and T3.

The following resolutions were passed:—

(1) "That immediate and vigorous steps be taken in order that the Standards Committee of the Australian Dental Association shall be officially recognised as a consultant body to the Department of Trade and Customs, and to ensure that, before any application for the importation of expendable dental materials is refused, the advice of this Committee is obtained by the Department."

(2) "In the event of an application for importation being refused by the Department, the Federal Officers may request the Standards Committee to investigate and comment upon the decision and may forward such a report direct to the Comptroller-General of Customs."

Standards Association of Australia: It was resolved that the payment of £5/5/-, being renewal of the Association's annual membership of the Standards Association of Australia, be authorised.

Meetings—Australian Dental Association: A letter, dated 23rd February, 1950, was received from the South Australian Branch, stating that the South Australian Branch considers that Melbourne is the most central place for their delegates for meetings.

British Dental Association—Annual Meeting, 1950: A letter, dated 1st February, 1950, requesting the nomination of a representative of the Australian Dental Association for the abovementioned meeting was tabled, and our reply dated 28th March, 1950, advising that the A.D.A. nominated Professor Arthur Amies as its representative, was approved.

International Dental Journal: A circular, dated 2nd March, 1950, was received from Cassell & Co. (Publishers), London, giving details of the official journal of the Federation Dentaire Internationale, and our reply was approved.

It was resolved that the payment of the sum of £2/12/11, being one year's subscription to the *International Dental Journal*, be authorised.

Election of Federal President as Honorary Member, New South Wales Branch: A letter, dated 25th November, 1949, informing the President of this honour, was tabled, and the reply, dated 1st December, 1949, was approved.

Flying Doctor Service: It was resolved that the payment of £1/1/-, being renewal of the Association's annual membership to the Flying Doctor Service, be authorised.

Proceedings of Congress: A letter, dated 4th October, 1949, from the Librarian, University of Adelaide, with reference to obtaining copies of Congress Proceedings was tabled, and the reply, dated 14th December, 1949, was approved.

Dental Post-graduate Bureau: The Programme of Dental Post-graduate Courses, 1949-50 received from the Dental Post-graduate Bureau, London, was tabled. It was resolved that the Bureau be requested to supply six extra copies of the Programme for distribution to State Branches.

Balance Sheet—Australian Dental Association: A letter, dated 2nd November, 1949, from the Victorian Branch regarding details of the disbursement of monies from the National Health Survey Fund was tabled, and our reply, dated 8th November, 1949, approved.

Scale of charges for dental treatment of Service personnel by civilian dentists: A letter, dated 21st February, 1950, was received from the New South Wales Branch, requesting that representations be made to the Minister for Repatriation that the scale of fees for treatment of repatriation patients be increased. This letter enclosed a Schedule of Fees for treatment of repatriation patients.

It was resolved that the Scale of Charges for treatment of service personnel by civilian dentists be obtained for comparison, and that this scale of charges, if acceptable, be sent to the Department of Repatriation with a request for its consideration and adoption.

Interview with Senator McKenna (Minister for Health and Social Services) 19th October, 1949: The report prepared by the Federal President in this connection was received, and the action taken endorsed.

Twenty-eighth Session of the National Health and Medical Research Council: The report prepared by the Federal President on this Session was received, and the action taken endorsed.

General Business:

Annual Meeting, 1950: It was resolved that the Annual Meeting of the Australian Dental Association be held on Friday, 25th August, 1950, from 9.15 a.m. to 1 p.m., in order to enable members to attend the important afternoon clinical session on the 25th.

It was further resolved that this information be conveyed to the Congress Commission, New South Wales Branch, with the request that appropriate arrangements be made.

Accounts:

Consideration of the basis of apportionment of expenditure incurred on behalf of both the Current Account and the National Dental Survey Fund: It was resolved that the allocation of expenditure incurred in connection with the Association's Current Account and the National Dental Survey Fund, based on the amount of work done, be approved as follows:—

	Current A/c.	N.D.S.F.
1st Aug., 1949, to 2nd Nov., 1949	25%	75%
3rd Nov., 1949, to 8th Mar., 1950	50%	50%
9th Mar., 1950, to 31st July, 1950	75%	25%

Consideration of the Treasurer's Report on the financial position—in particular, consideration of the method of meeting the expenditure of the National Dental Survey

Fund: At 2nd May, 1950, this account was overdrawn by £197/5/5. It was resolved that no extra levy be made to reimburse the National Dental Survey Fund, but that the amount overdrawn be paid out of the Current A/c.

The Honorary Treasurer, Mr. Peverill, presented an Analysis of Expenses and Budget for the period ending 31st April, 1951, together with a report setting out the financial position of the Association. It was resolved that a letter in the following terms be forwarded to State Branches:—

"Arising out of the submission of the Treasurer's Report and Budget to the Federal Officers, you are now informed that, in their opinion, an increase in revenue will be necessary for the future conduct of the affairs of the Association."

NEW SOUTH WALES BRANCH

Extract from the Minutes of the Meeting of Executive Committee held in the Council Room, B.M.A. House, 135-137 Macquarie Street, Sydney, on Monday, 8th May, 1950, at 7.30 p.m.

Present: Dr. E. R. Magnus, Dr. A. G. H. Lawes, Dr. F. E. Helmore, Dr. R. M. Cloutier, Dr. J. V. Hall Best, Mr. N. E. Edney, Mr. H. M. Finnie, Mr. W. A. Grainger, Mr. R. Krauss, Mr. R. Y. Norton, Mr. F. R. Reid, Mr. J. W. Skinner, Mr. H. R. Sullivan, Mr. R. W. Wilson, Mr. L. Mackenzie, Mr. C. D. Reynolds, Dr. A. G. Rowell.

Apologies: Mr. R. G. Leeder, Mr. Ralph Tompson, Mr. S. H. Neal, Dr. J. D. Benson, Dr. J. D. Oddy.

In attendance: Mr. Robert Harris, Secretary.

Minutes: The Minutes of the meeting held 17th April, 1950, were signed as a correct record.

Business Arising from Minutes:

Delegates from Divisions Meeting: The Secretary reported that the Delegates from Divisions Meeting had been arranged for Monday, 5th June, 1950, and that all Divisions had been notified of this and, further, that the Southern Division had intimated that it would not be sending representatives as the meeting was not considered necessary.

Reports from Committees:

Divisions: The Chairman of the Divisions Committee, Mr. Krauss, reported that the North-eastern Division planned to hold a convention during May.

The President stated that he had visited Wagga Wagga during the weekend, 29th-30th April, 1950, for the Southern Division's meeting at which four clinicians from Melbourne gave excellent clinics and at which forty members were present.

Survey of Fees: The report of the Survey of Fees Committee having been circulated, Mr. Skinner, the Chairman, commented on the figures and the method of compilation; he drew attention to the uniformity of the figures received from all areas with the exception of the city and reported that it had been found that new graduates were charging higher fees than the older members. Consideration was then given to the question of how the information obtained from the returns could be given to the members and the advisability or otherwise of publishing the figures.

It was resolved that Mr. N. Peverill, of Melbourne, be approached to give a lecture at the June General Meeting similar to the one he had recently given at Wagga Wagga; that the survey of fees figures be given to Mr. Peverill for inclusion in his lecture, and that a member of the Survey of Fees Committee be asked to correlate information and be prepared to open the discussion at the meeting.

The question of dissemination of the information to country members in particular was considered and it was suggested that the increase percentages be published either in the *Journal* or in a statement for circulation.

It was resolved that the matter of the ways and means of disseminating this information be referred back to the Survey of Fees Committee for report back to the next meeting of the Executive Committee.

Syllabus: It was resolved (1) that permission be granted for Dr. Cloutier and Dr. C. H. Graham to lecture on the 27th and 28th May, 1950, at the meeting of the North-eastern Division; (2) that permission be granted for Dr. Magnus and Dr. Rowell to lecture on the 27th and 28th May, 1950, at the meeting of the Western Division.

Membership:

New Members: It was resolved that the following dental practitioners, whose applications were in order and who had paid the requisite subscriptions, be admitted to membership of this State Branch as from 8th May, 1950:—

Abbott, Bruce; Anderson, Patrick Joseph; Chapman, Stuart Morton; Cotton, Charles Leslie; Fowler, Geoffrey James; Dyson, Bruce Crosby; Heard, Charles Robert; Jauncey, James Lindley Crawford; Jones, William Dallas; McGee, Grahame Andrew;

McManus, Leslie Alfred; Shanks, Peter; Stewart, Robert John; Symons, Allan Wesley.

Resignations: It was resolved that the resignations of Mr. J. F. Reading, B.D.S., and Mr. G. T. Hutchinson, B.D.S., be accepted as from 31st December, 1950, and that the resignation of Mr. J. P. Byrne be accepted as from 31st December, 1949.

Deceased: It was noted with regret that Mr. Reginald Reuben, of Strathfield, and Mr. F. G. Middleton, of Sydney, had died on 18th April, 1950, and 17th April, 1949, respectively.

Correspondence:

Professor Bradlaw: A letter, dated 22nd April, 1950, from Professor R. Bradlaw expressing appreciation of the hospitality and kindness he received during his visit to Sydney, was read and received.

Professor Arnott and Dr. Hall Best: Letters, dated 21st and 23rd April, 1950, from Professor A. J. Arnott and Dr. J. V. Hall Best, thanking the Executive for their hospitality in entertaining them to dinner, were read and received.

Australian-American Association: A letter from the Australian-American Association, asking for a donation towards the memorial to America to be erected in Canberra, was read.

It was resolved that publicity to this appeal be given in the next issue of the *Dental Journal of Australia*.

Flood Damage:

The Secretary reported that he had written to the Divisions enquiring if any members had suffered damage to property as a result of the recent floodings and had received replies from the Western and Southern Divisions indicating that no damage had been sustained.

Federal Constitution:

A letter, dated 24th April, 1950, from Dr. J. V. Hall Best was read making suggestions for additional amendments to the Federal Constitution. It was suggested that a drafting committee consisting of representatives from, say, two States, should be appointed to consider the whole Constitution and re-draft the necessary clauses, but it was submitted that the other four States might not be satisfied with this arrangement, particularly as it was understood that South Australia had already gone into the whole matter.

It was resolved that this Executive accept in general principle the headings as set out in Dr. Best's letter under which the Constitution needs amendment and that the Federal Office be advised accordingly.

Congress Commission:

Dr. Hall Best reported that the clinical programme of Congress was to be finalised on Friday and that action was being taken to get some sections into satisfactory form; a letter from Admiral Rault had intimated that the United States Naval Delegation will not be coming to Congress; Mr. Bastian had offered to give a lecture; Dr. Terrell had suggested bringing a tape recording; Dr. Kelsey Fry will not be coming to Congress; American, Canadian and New Zealand Dental Associations will be represented, but so far the British Dental Association has not yet appointed a representative.

This report was received.

The meeting terminated at 10.45 p.m.

WESTERN DIVISION

A General Meeting of the Western Division was held at the Hotel Canoblas, Orange, on 27th May, 1950.

Sixteen members of the Division attended, as well as Dr. E. R. Magnus, President of the New South Wales Branch of the Association.

The minutes of the General Meeting held on 13th November, 1948, were confirmed.

It was moved and seconded that the Annual Meeting be held to coincide with the visit of Dr. Terrell.

A discussion of subjects on the Agenda for the forthcoming House of Delegates Meeting was held. The Delegates were instructed to support the following items:—

(a) that the procedure of the first meeting of the Central Executive after the annual elections be altered to allow the election of additional members under Article 25A to take place prior to the election of the President for the year;

(b) organisation of country congresses.

Dr. Magnus presented a paper on "Non-vital Teeth in Relation to Systemic Disease." Dr. Rowell followed with a paper on the "Vertical Dimension and the Effect of its Loss on Edentulous and Partially Edentulous Patients."

The meeting concluded and members adjourned to a dinner held at the Standards Hotel.



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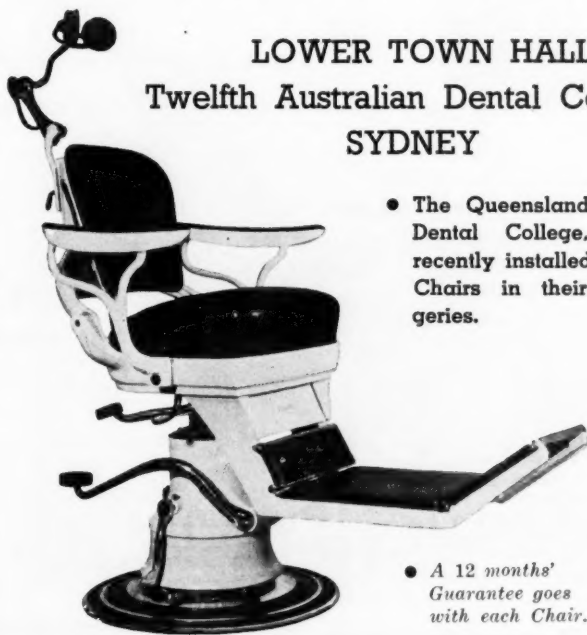
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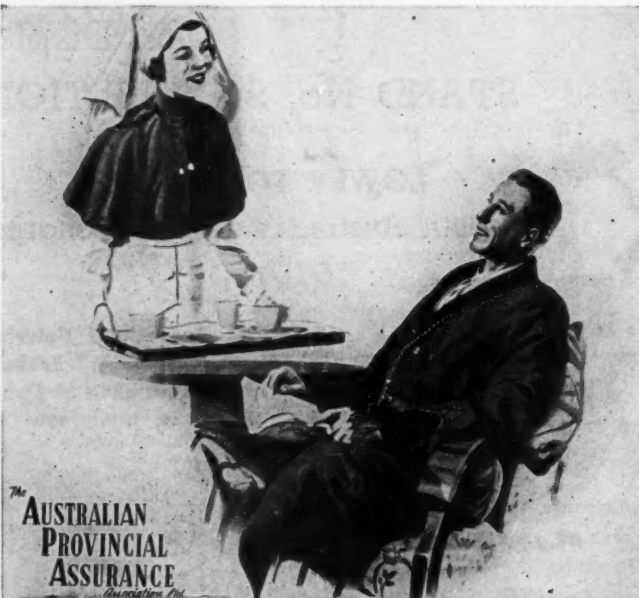
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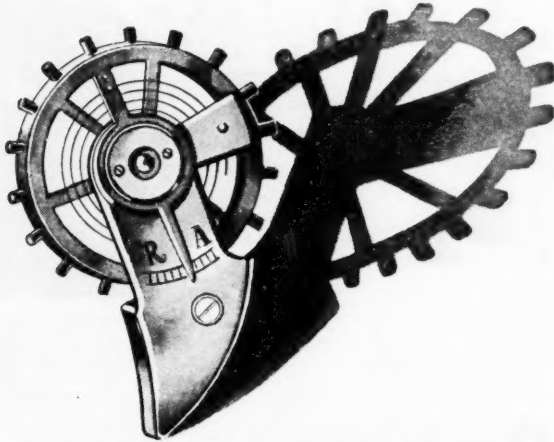
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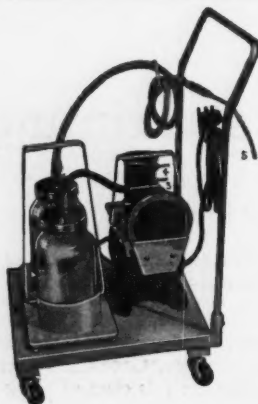
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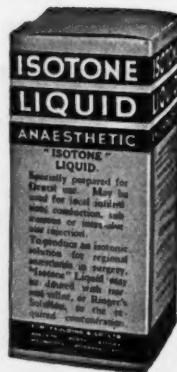
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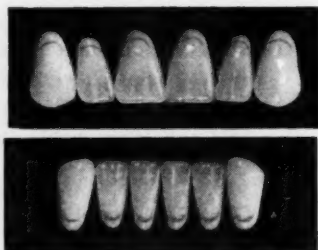
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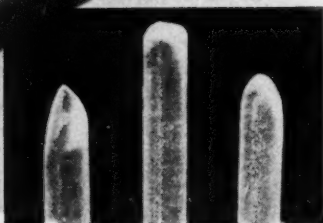
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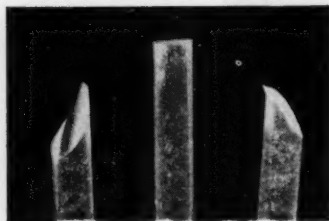


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